SmartSwitch Series
2E42, 2E43, 2E48, 2E49, 2H22, 2H23, 2H28, 2H33 and 2M46

Local Management Supplement

9032971-01

CABLETRON
SYSTEMS

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Cabletron Systems, Inc.
35 Industrial Way
Rochester, NH 03867

Order Number: 9032971-01 August 1999

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Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
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Manufacturer's Address:	**35 Industrial Way** **PO Box 5005** **Rochester, NH 03867**
European Representative Name:	**Mr. J. Solari**
European Representative Address:	**Cabletron Systems Limited** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG14 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EC Directive 73/23/EEC** **EN 55022** **EN 50082-1** **EN 60950**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Manufacturer	Legal Representative in Europe
Mr. Ronald Fotino	Mr. J. Solari
Full Name	Full Name
Principal Compliance Engineer	Managing Director - E.M.E.A.
Title	Title
Rochester, NH, USA	Newbury, Berkshire, England
Location	Location

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CHAPTER 2 LM SECURITY SCREENS FOR 2E43-51/2E43-51R DEVICES

CHAPTER 3 LM SECURITY SCREENS FOR 2H23-50R/2H33-37R DEVICES

CHAPTER 4 GENERIC ATTRIBUTE REGISTRATION PROTOCOL (GARP)

CHAPTER 5 NETWORK TOOLS

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Figure Page

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CHAPTER 1

CHANGES TO LOCAL MANAGEMENT SCREENS

This chapter introduces the scope of this document, new hierarchy, and new screens (except security screens) affected by the 4.08.xx and 4.09.xx firmware revisions.

Chapter 2 describes the revised security screens for the 2E43-51 and 2E43-51R repeater devices. Chapter 3 describes the security screens for the 2H23-50R and 2H33-37R repeater devices. Chapter 5 describes a new Network Tools command, cdp.

1.1 INTRODUCTION

This supplement applies to the SmartSwitch standalone devices with firmware revisions through 4.09.xx and documents the changes and additions affecting the 802.1Q VLAN User’s Guide and the SmartSwitch user’s guides listed in Table 1-1.

Table 1-1 User’s Guides Affected by Revisions

Title	Part Number
802.1Q VLAN User’s Guide	9032599-02
2E42-27/2E42-27R/2E43-27/2E43-27R User’s Guide	9031960-05
2E43-51/2E43-51R User’s Guide	9032251-04
2E48-27R/2E49-27R User’s Guide	9032314-04
2H22-08R User’s Guide	9032385-02
2H23-50R/2H33-37R User’s Guide	9032286-04
2H28-08R User’s Guide	9032380-03
2M46-04R/2M46-04RDC User’s Guide	9032363-02

NOTE

This document applies to several SmartSwitch models. Unless otherwise noted, the term SmartSwitch is used in the following text instead of a particular model number.

1.2 ACCESSING LOCAL MANAGEMENT

Access to Local Management is controlled through the Password screen.

1.2.1 Navigating Local Management Screens

The Local Management application consists of a series of menu screens. Navigate through Local Management by selecting items from the menu screens.

The SmartSwitch supports two modes of switch operation. The switching modes are as follows:

- 802.1D Switching (traditional switching)
- 802.1Q Switching (802.1Q port based VLANs)
- SecureFast VLAN (Cabletron Systems SecureFast switching). A separate image is required for this operation.

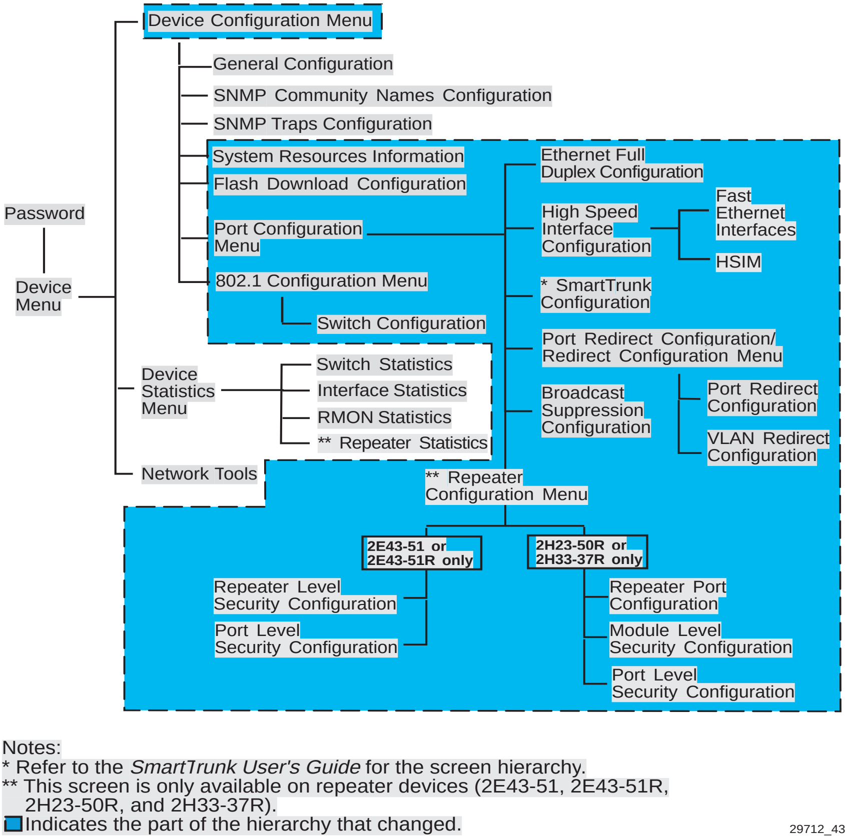
NOTE

Refer to the Release Notes shipped with the product to verify which screens are supported in each of the available switching modes.

Depending on the Operational Mode set for the device, the hierarchy of the Local Management screens differs as shown in Figure 1-1 and Figure 1-2. Refer to the appropriate figure that relates to the Operational Mode set for the device to see the applicable Local Management screen hierarchy.

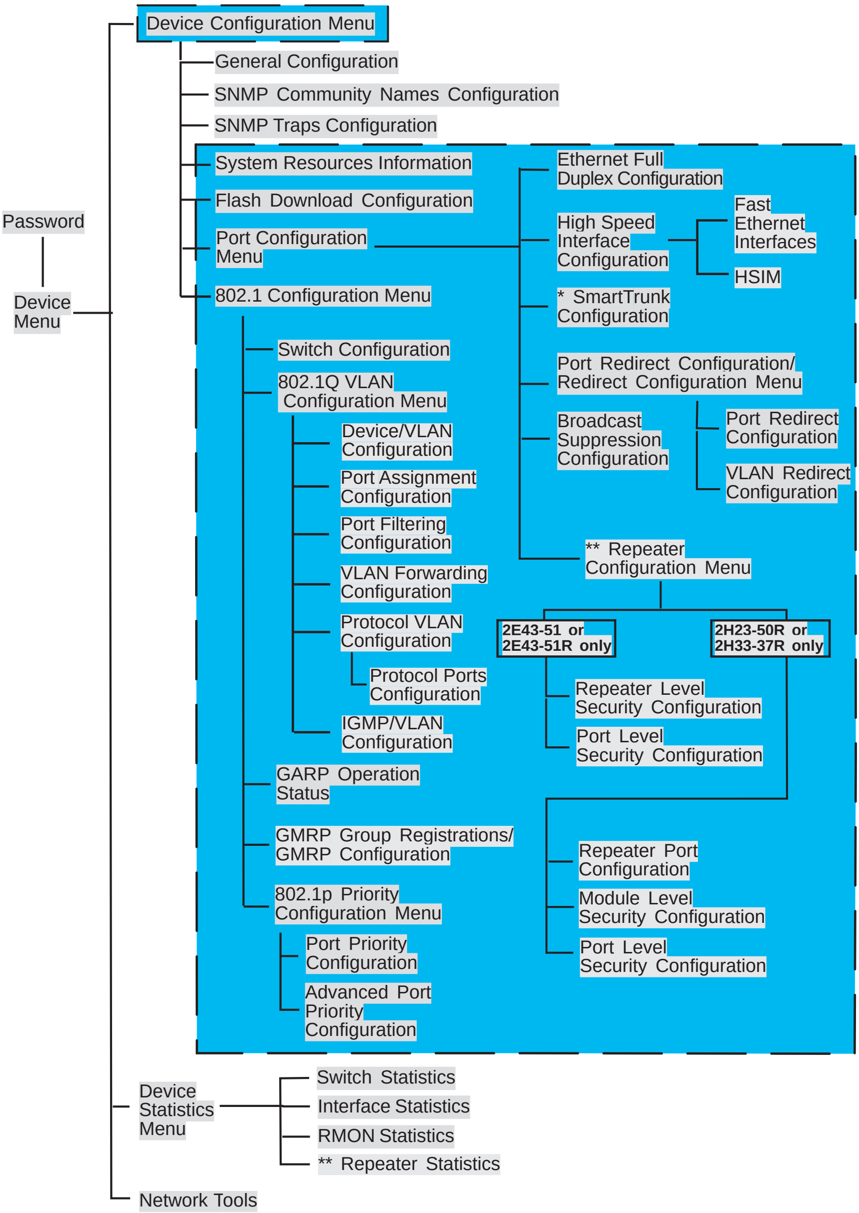
NOTE

The areas that changed in the hierarchy are highlighted as shown in Figure 1-1 and Figure 1-2. The screens involved are covered in this document. **These screens may have been added or revised, or changed location in the hierarchy.**


Password
Device Menu
Device Configuration Menu
General Configuration
SNMP Community Names Configuration
SNMP Traps Configuration
System Resources Information
Flash Download Configuration
Port Configuration Menu
802.1 Configuration Menu
Switch Configuration
Ethernet Full Duplex Configuration
High Speed Interface Configuration
Fast Ethernet Interfaces
HSIM
* SmartTrunk Configuration
Port Redirect Configuration/ Redirect Configuration Menu
Broadcast Suppression Configuration
Port Redirect Configuration
VLAN Redirect Configuration
Device Statistics Menu
Switch Statistics
Interface Statistics
RMON Statistics
** Repeater Statistics
Network Tools
** Repeater Configuration Menu
2E43-51 or 2E43-51R only
2H23-50R or 2H33-37R only
Repeater Level Security Configuration
Port Level Security Configuration
Repeater Port Configuration
Module Level Security Configuration
Port Level Security Configuration
29712_43

Notes:
* Refer to the *SmartTrunk User's Guide* for the screen hierarchy.
** This screen is only available on repeater devices (2E43-51, 2E43-51R, 2H23-50R, and 2H33-37R).
▇ Indicates the part of the hierarchy that changed.

Figure 1-1 802.1D Switching Mode, LM Screen Hierarchy


Password
Device Menu
Device Configuration Menu
General Configuration
SNMP Community Names Configuration
SNMP Traps Configuration
System Resources Information
Flash Download Configuration
Port Configuration Menu
802.1 Configuration Menu
Switch Configuration
802.1Q VLAN Configuration Menu
Device/VLAN Configuration
Port Assignment Configuration
Port Filtering Configuration
VLAN Forwarding Configuration
Protocol VLAN Configuration
Protocol Ports Configuration
IGMP/VLAN Configuration
GARP Operation Status
GMRP Group Registrations/ GMRP Configuration
802.1p Priority Configuration Menu
Port Priority Configuration
Advanced Port Priority Configuration
Ethernet Full Duplex Configuration
High Speed Interface Configuration
Fast Ethernet Interfaces
HSIM
* SmartTrunk Configuration
Port Redirect Configuration/ Redirect Configuration Menu
Broadcast Suppression Configuration
Port Redirect Configuration
VLAN Redirect Configuration
** Repeater Configuration Menu
2E43-51 or 2E43-51R only
2H23-50R or 2H33-37R only
Repeater Level Security Configuration
Port Level Security Configuration
Repeater Port Configuration
Module Level Security Configuration
Port Level Security Configuration
Device Statistics Menu
Switch Statistics
Interface Statistics
RMON Statistics
** Repeater Statistics
Network Tools

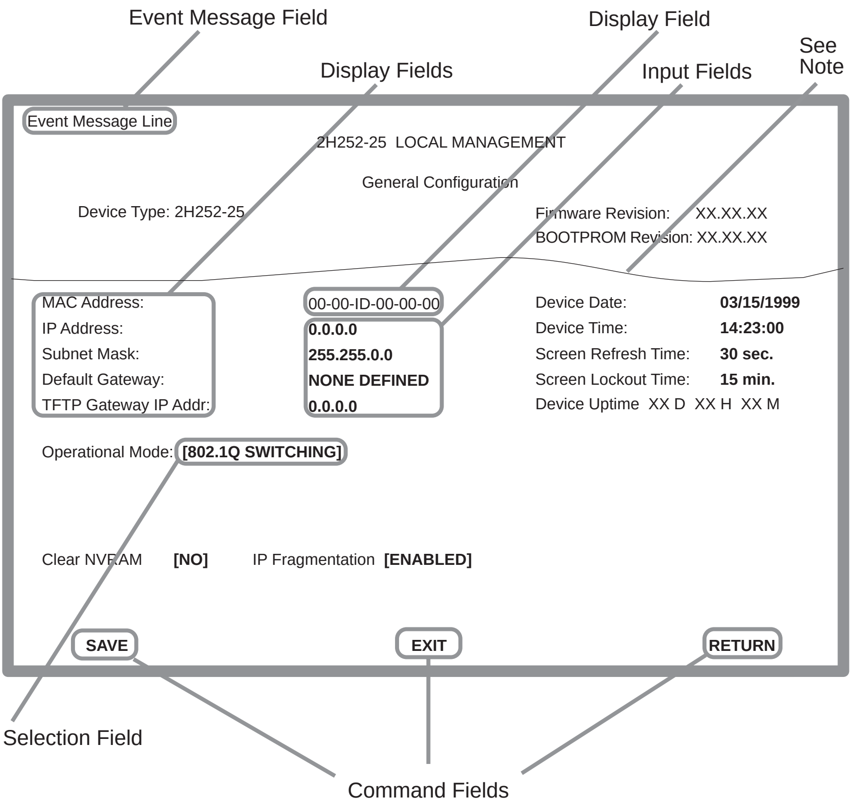
Notes:
* Refer to the *SmartTrunk User's Guide* for the screen hierarchy.
** This screen is only available on repeater devices (2E43-51, 2E43-51R, 2H23-50R, and 2H33-37R).
🟦 Indicates the part of the hierarchy that changed.

29713-82

Figure 1-2 802.1Q Switching Mode, LM Screen Hierarchy

1.2.2 Screen Format

Since the top part of the screen contains the same type of information (the name of the screen, the SmartSwitch model number, the firmware revision, and the BOOT PROM revision), it is not shown in the following descriptions of the screens. Only the lower portion of the screens is shown in the following screen descriptions. The name of the screen is shown in the figure title for each screen. Figure 1-3 shows an example of the fields in a screen.



```
Event Message Line
                         2H252-25  LOCAL MANAGEMENT

                           General Configuration

     Device Type: 2H252-25                          Firmware Revision:    XX.XX.XX
                                                    BOOTPROM Revision: XX.XX.XX

  MAC Address:              00-00-ID-00-00-00       Device Date:           03/15/1999
  IP Address:               0.0.0.0                 Device Time:           14:23:00
  Subnet Mask:              255.255.0.0             Screen Refresh Time:   30 sec.
  Default Gateway:          NONE DEFINED            Screen Lockout Time:   15 min.
  TFTP Gateway IP Addr:     0.0.0.0                 Device Uptime  XX D  XX H  XX M

  Operational Mode: [802.1Q SWITCHING]


  Clear NVRAM     [NO]      IP Fragmentation  [ENABLED]


      SAVE                        EXIT                          RETURN
```

Note:
This shows the location of the cutaway that is used in most of the screen graphics in this document. The top portion of the screen is cut away to eliminate repeating the same information in each graphic.The screen title is contained in the figure title for each screen.

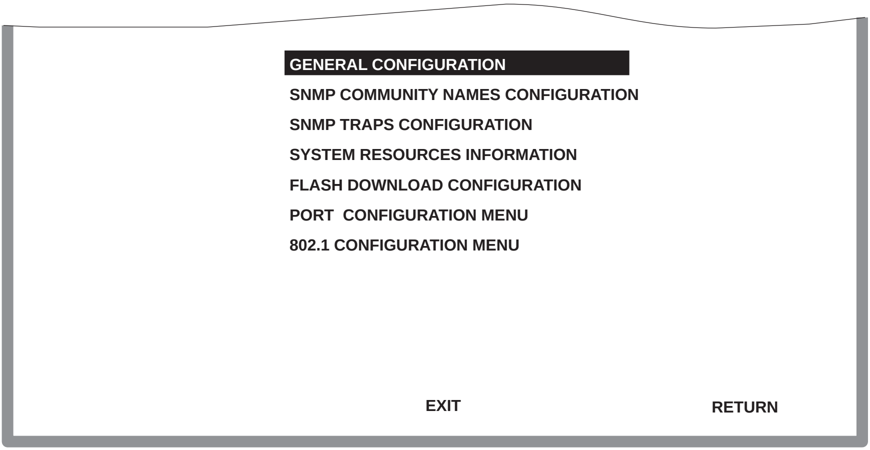
2971_14

Figure 1-3 Example of a Local Management Screen

1.3 DEVICE CONFIGURATION MENU SCREEN

The Device Configuration Menu screen, Figure 1-4, provides access to Local Management screens that allow you to configure and monitor operating parameters, modify SNMP community names, set SNMP traps, configure switch parameters and configure ports.

To access the Device Configuration Menu screen from the Device Menu screen, use the arrow keys to highlight the **DEVICE CONFIGURATION** menu item and press ENTER. The Device Configuration Menu screen displays.



19602_66

Figure 1-4 Device Configuration Menu Screen

The following briefly explains each screen accessible from the Device Configuration Menu screen:

GENERAL CONFIGURATION

Used to monitor and configure SmartSwitch operating parameters. For details, refer to your SmartSwitch device user’s guide.

SNMP COMMUNITY NAMES CONFIGURATION

Used to enter new, change, or review the community names used as access passwords for device management operation. Access is limited based on the password level of the user. For details, refer to your SmartSwitch device user’s guide.

SNMP TRAPS CONFIGURATION

Provides display and configuration access to the table of IP addresses used for trap destinations and associated community names. For details, refer to your SmartSwitch device user’s guide.

SYSTEM RESOURCES INFORMATION

Displays the CPU type used in the device and its operating speed; displays the size of each memory system used (FLASH memory, DRAM and NVRAM) in the device and the unused portion of each memory; and displays the current CPU (switch) utilization and the peak switch utilization. For details, refer to Section 1.4.

FLASH DOWNLOAD CONFIGURATION

Used to force the SmartSwitch to download a new image file from a TFTP server to its FLASH memory. For details, refer to Section 1.5.

PORT CONFIGURATION MENU

Used to select the screens for configuring the SmartSwitch ports. For details, refer to Section 1.6.

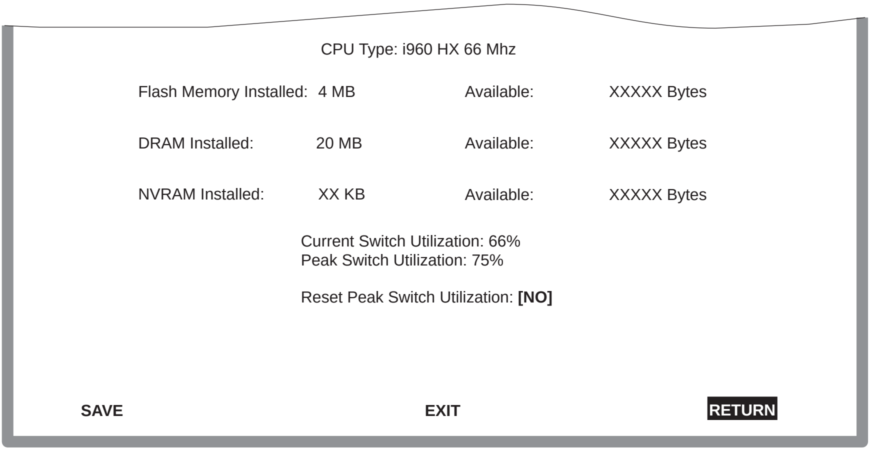
802.1 CONFIGURATION MENU

Displays only if the SmartSwitch has been configured to operate as an IEEE 802.1Q switch. When selected, the 802.1 Configuration Menu screen provides access to the Switch Configuration, 802.1Q VLAN Configuration Menu, GARP Operation Status, GMRP Group Registrations, and 802.1p Priority Configuration Menu screens. For details, refer to Section 1.15.

1.4 SYSTEM RESOURCES INFORMATION SCREEN

The System Resources Information screen, Figure 1-5, provides information concerning the processor used in the SmartSwitch and the amount of FLASH memory, DRAM, and NVRAM that is installed and how much of that memory is available. This screen is used to monitor the current switch utilization and the peak switch utilization.

To access the System Resources Information screen from the Device Configuration Menu screen, use the arrow keys to highlight the **SYSTEM RESOURCES INFORMATION** menu item and press ENTER. The System Resources Information screen displays.



```
                         CPU Type: i960 HX 66 Mhz

Flash Memory Installed:  4 MB          Available:       XXXXX Bytes

DRAM Installed:          20 MB         Available:       XXXXX Bytes

NVRAM Installed:         XX KB         Available:       XXXXX Bytes

                   Current Switch Utilization: 66%
                   Peak Switch Utilization: 75%

                   Reset Peak Switch Utilization: [NO]
```

Figure 1-5 System Resources Information Screen

The following briefly defines each field of the System Resources Information screen.

CPU Type (Read-Only)

Indicates the microprocessor used in the SmartSwitch.

Flash Memory Installed (Read-Only)

Indicates the amount of FLASH memory installed in the SmartSwitch and how much is currently available.

DRAM Installed (Read-Only)
Indicates the amount of DRAM installed in the SmartSwitch and how much of it is currently available.

NVRAM Installed (Read-Only)
Indicates the amount of NVRAM installed in the SmartSwitch and how much of it is currently available.

Current Switch Utilization (Read-Only)
Shows the percentage of the device switching capacity currently being used.

Peak Switch Utilization (Read-Only)
Shows the peak percentage of device switching capacity used, since the last reset.

Reset Peak Switch Utilization (Toggle)
Used to reset the Peak Switch Utilization field. The switch may be set to either YES or NO as described in Section 1.4.1. YES resets the Peak Switch Utilization field to the current system utilization.

1.4.1 Resetting the Reset Peak Switch Utilization

To set the Reset Peak Switch Utilization field to YES or NO, proceed as follows:

1. Use the arrow keys to highlight the **Reset Peak Switch Utilization** field.
2. Press the SPACE bar to select **YES** or **NO**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays and the Reset Peak Utilization counter resets to zero.

1.5 FLASH DOWNLOAD CONFIGURATION SCREEN

The Flash Download Configuration screen, shown in Figure 1-6, is used to download a new image file from a TFTP server to Flash memory.

NOTE

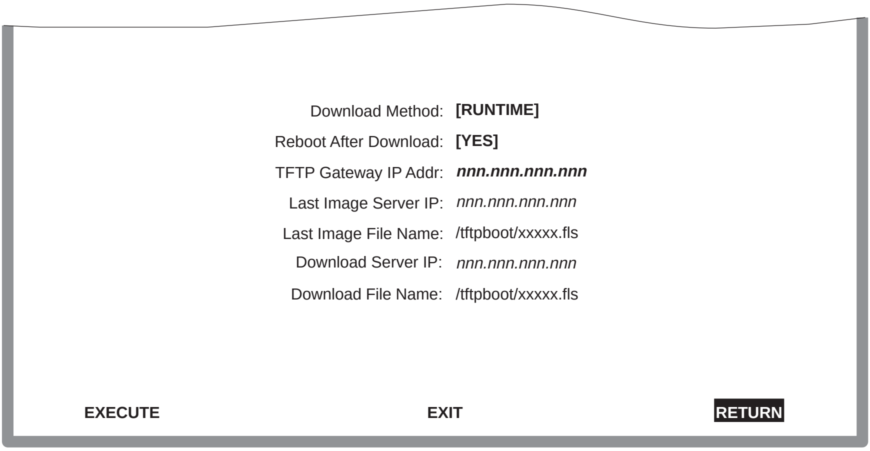
The user may also force the download of an image by changing the position of dipswitch 6 located inside the device. Refer to your user's guide for details.

Before downloading an image to the device, copy the image to the network TFTP server.

NOTE

For information on how to set up a workstation as a TFTP server, refer to the specific workstation documentation.

To access the Flash Download Configuration screen from the Device Configuration Menu screen, use the arrow keys to highlight the **FLASH DOWNLOAD CONFIGURATION** menu item and press ENTER. The Flash Download Configuration screen displays.



```
          Download Method:  [RUNTIME]
    Reboot After Download:  [YES]
    TFTP Gateway IP Addr:  nnn.nnn.nnn.nnn
     Last Image Server IP:  nnn.nnn.nnn.nnn
    Last Image File Name:  /tftpboot/xxxxx.fls
      Download Server IP:  nnn.nnn.nnn.nnn
      Download File Name:  /tftpboot/xxxxx.fls
```

Figure 1-6 Flash Download Configuration Screen

NOTE

Download Server IP and Download Server File Name display only when **TFTP** or **RUNTIME** are selected in Download Method.

The following briefly defines each field of the Flash Download Configuration screen:

Download Method (Selectable)

This field steps between TFTP, RUNTIME and BOOTP. If set for BOOTP, the device sends out a BootP request to determine the IP address of the TFTP server and the filename of the image to be downloaded. If set for TFTP or RUNTIME, the SmartSwitch device attempts a TFTP download based on the IP address and filename entered in the fields at the bottom of the Flash Download Configuration screen.

Section 1.5.1 describes how to download using TFTP. Section 1.5.2 describes how to download using RUNTIME. Section 1.5.3 describes how to download using BootP.

Reboot After Download (Modifiable when user chooses RUNTIME)

This field notifies the user that the SmartSwitch device will reboot after the download is complete. If a RUNTIME Download is performed, this field toggles between YES and NO. If YES is selected, the device reboots after the download is completed. If NO is selected, the device will continue using the existing firmware image. The device stores the new firmware image in FLASH memory. When the device is reset, the device will boot from FLASH memory using the new image.

TFTP Gateway IP Addr (Selectable)

This field shows the IP address of the TFTP gateway server defined in the General Configuration screen.

Last Image Server IP (Read-only)

This field shows the IP address of the server used for the previous FLASH Download.

Last Image File Name (Read-only)

This field shows the complete path and file name of the last image downloaded to FLASH.

NOTE

If TFTP or RUNTIME is selected as the download method, the following two additional fields display.

Download Server IP (Selectable)

The IP address of the TFTP server to be used for the FLASH download is entered in this field.

Download File Name (Selectable)

The complete TFTP server path and file name of the new image is entered in this field.

1.5.1 Image File Download Using TFTP

Set the SmartSwitch device to download to FLASH using TFTP as follows:

1. Use the arrow keys to highlight the **Download Method** field.
2. Use the SPACE bar to select **TFTP**.
3. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.
4. Set the IP address of the TFTP gateway server (this defaults to the same IP address as that set in the TFTP Gateway IP Addr field on the General Configuration screen).
5. Use the arrow keys to highlight the **Download Server IP** field.
6. Enter the IP address of the TFTP server using the DDN format.

   For example: *nnn.nnn.nnn.nnn*
7. Use the arrow keys to highlight the **Download File Name** field.
8. Enter the complete path and file name of the image stored on the download server.

   For example: /tftpboot/2H23.hex
9. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message “TFTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS...” displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

1.5.2 Image File Download Using Runtime

Set the SmartSwitch device to download to FLASH using RUNTIME as follows:

1. Use the arrow keys to highlight the **Download Method** field.
2. Use the SPACE bar to step to **RUNTIME**.
3. Use the arrow keys to highlight the **Reboot After Download** field.
4. Use the SPACE bar to select either **YES** or **NO**. Select **YES** if you want the device to reboot after the download is complete. Select **NO** if you want the device to store the new image in FLASH memory until the device is manually reset.
5. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.
6. Set the IP address of the TFTP gateway server (this defaults to the same IP address as that set in the TFTP Gateway IP Addr field on the General Configuration screen).
7. Use the arrow keys to highlight the **Download Server IP** field.
8. Enter the IP address of the TFTP server using the DDN format.

   For example: *nnn.nnn.nnn.nnn*
9. Use the arrow keys to highlight the **Download File Name** field.
10. Enter the complete path and file name of the image stored on the download server.

    For example: /tftpboot/2H23.fls
11. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message “RUNTIME DOWNLOAD. WILL COMMIT TO FLASH.” displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

1.5.3 Image File Download Using BootP

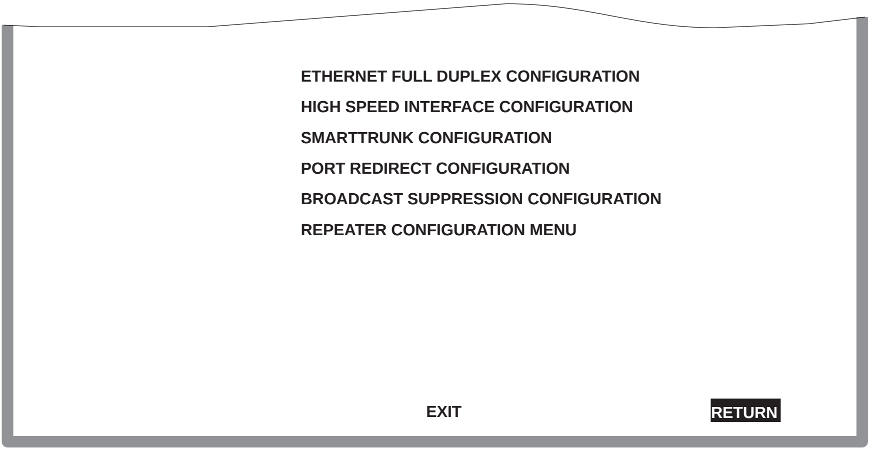
Set the SmartSwitch device to download to FLASH using BootP as follows:

1. Use the arrow keys to highlight the **Download Method** field.
2. Use the SPACE bar to select **BOOTP**.
3. Use the arrow keys to highlight the **TFTP Gateway IP Addr** field.
4. Set the IP address of the TFTP gateway server (this defaults to the same IP address set in the TFTP Gateway IP Addr field in the General Configuration screen).
5. Use the arrow keys to highlight **EXECUTE** at the bottom of the screen and press ENTER. The message “BOOTP DOWNLOAD. WILL COMMIT TO FLASH. REBOOT IN PROGRESS...” displays in the event message line at the top of the screen and the new image is downloaded into FLASH memory.

1.6 PORT CONFIGURATION MENU SCREEN

The Port Configuration Menu screen, Figure 1-7, is used to select screens to perform port configuration tasks on the SmartSwitch.

To access the Port Configuration Menu screen from the Device Configuration Menu screen, use the arrow keys to highlight the **PORT CONFIGURATION MENU** item and press ENTER. The Port Configuration Menu screen displays.



ETHERNET FULL DUPLEX CONFIGURATION

HIGH SPEED INTERFACE CONFIGURATION

SMARTTRUNK CONFIGURATION

PORT REDIRECT CONFIGURATION

BROADCAST SUPPRESSION CONFIGURATION

REPEATER CONFIGURATION MENU

EXIT RETURN

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Figure 1-7 Port Configuration Menu Screen

The following briefly defines each selectable item of the Port Configuration Menu screen:

ETHERNET FULL DUPLEX CONFIGURATION

The Ethernet Full Duplex Configuration screen allows each 10 Mbps port to be set for either Standard Ethernet or Full Duplex operation. The screen also indicates whether or not each port is linked to another 10BASE-T device and if that port is enabled. For details, refer to Section 1.7.

HIGH SPEED INTERFACE CONFIGURATION

NOTE

The High Speed Interface Configuration screen selection does not display unless an optional interface module is installed.

The High Speed Interface Configuration screen provides access to the Fast Ethernet Interfaces screen and the HSIM screen. For details, refer to Section 1.8.

SMARTTRUNK CONFIGURATION

Used to logically group interfaces together to create a greater bandwidth uplink. Refer to the Cabletron Systems *SmartTrunk User's Guide* for information about how to access and use the SmartTrunk screens.

PORT REDIRECT CONFIGURATION

Used to access the Redirect Configuration Menu screen, which provides access to the Port Redirect Configuration and VLAN Redirect Configuration screens. For details, refer to Section 1.10.

BROADCAST SUPPRESSION CONFIGURATION

Used to set a desired limit of received broadcast frames that are forwarded out other interfaces. For details, refer to Section 1.13.

REPEATER CONFIGURATION MENU

Used to access the repeater configuration screens, which enable the user to configure operations and security at the connector and port level.

In the 2E43-51and 2E43-51R devices, the screens are the Repeater Level Security Configuration and Port Level Security Configuration screens.

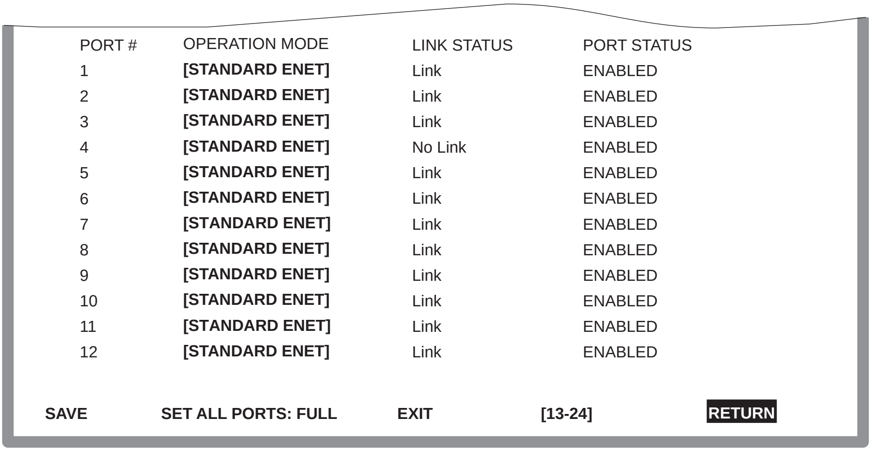
In the 2H23-50R and 2H33-37R devices, the screens are the Repeater Configuration Menu screen and its two subordinate screens, Repeater Level Security Configuration and Port Level Security Configuration screens.

For details on setting the security on the repeater devices, refer to Section 1.14.

1.7 ETHERNET FULL DUPLEX CONFIGURATION SCREEN

The Ethernet Full Duplex Configuration screen, Figure 1-8, allows the user to set the front panel ports, individually or all at once, to either Standard Ethernet or Full Duplex operation, and monitor each port to see whether or not it is enabled and linked to another Ethernet device. Refer to Section 1.7.1 to set the Operation Mode.

To access the Ethernet Full Duplex Configuration screen from the Port Configuration Menu screen, use the arrow keys to highlight the **ETHERNET FULL DUPLEX CONFIGURATION** menu item and press ENTER. The Ethernet Full Duplex Configuration screen displays.



PORT #	OPERATION MODE	LINK STATUS	PORT STATUS
1	[STANDARD ENET]	Link	ENABLED
2	[STANDARD ENET]	Link	ENABLED
3	[STANDARD ENET]	Link	ENABLED
4	[STANDARD ENET]	No Link	ENABLED
5	[STANDARD ENET]	Link	ENABLED
6	[STANDARD ENET]	Link	ENABLED
7	[STANDARD ENET]	Link	ENABLED
8	[STANDARD ENET]	Link	ENABLED
9	[STANDARD ENET]	Link	ENABLED
10	[STANDARD ENET]	Link	ENABLED
11	[STANDARD ENET]	Link	ENABLED
12	[STANDARD ENET]	Link	ENABLED

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Figure 1-8 Ethernet Full Duplex Configuration Screen

This section explains each field of the Ethernet Full Duplex Configuration screen.

PORT # (Read-only)

Identifies the number of the port.

OPERATION MODE (Toggle)

Allows the user to set the specified port to transmit and receive data separately (Standard) or simultaneously (Full Duplex). Set this field to one of the following values:

- **STANDARD ENET –** The port is running in half duplex (default) and either transmits data or receives data, but not both at the same time. To set Ethernet ports for Standard operation, refer to Section 1.7.1.
- **FULL DUPLEX –** Depending on the SmartSwitch, the port transmits and receives data simultaneously at 10 or 100 Mbps, thus enabling the port to effectively switch at 20 or 200 Mbps. To set Ethernet ports for Full Duplex operation, refer to Section 1.7.1.

LINK STATUS (Read-only)
Indicates whether there is a physical connection from this port to another Ethernet device. One of the following values displays:

- **Link –** A link signal is present; there is a valid physical connection from this port to another device.
- **No Link –** No link signal is present; there is no valid physical connection from this port to another device.

PORT STATUS (Read-only)
Indicates whether the port was turned on or off administratively (by the user). One of the following values is displayed:

- **ENABLED –** The port is turned on administratively.
- **DISABLED –** The port is turned off administratively.

NOTE

Enabling or disabling ports from the Switch Configuration screen is described in Section 1.16.3.

SET ALL PORTS (Toggle)
All front panel ports can be set at once to either **STANDARD** or **FULL DUPLEX** from this field. To set ports, refer to Section 1.7.1.

[1-12], [13-24], [25-36], or [37-48] (Navigation Key)
When the Full Duplex Configuration screen displays, the current operation mode and status information are displayed for the first 12 ports. This field allows the user to step to another screen for the same type of information for ports 13 through 24, 25 through 36, and 37 through 48, if available. The number of ports available is dependent on the SmartSwitch model. To navigate to the next screen, highlight the **[xx-xx]** field and press ENTER. The user can change the Operation Mode fields while in any of the selected screens.

1.7.1 Setting the Operational Mode

The Operational Mode may be set to Standard Ethernet or Full Duplex either one port at a time or all at once. The following steps describe setting the port Operational Mode for individual ports followed by steps to set the Operational Mode for all ports.

To set the Operational Mode for individual ports, proceed as follows:

1. Use the arrow keys to highlight the **Operation Mode** field adjacent to the number of the port(s) that you plan to change.

NOTE

The Operation Mode for the first 12 ports can be changed on the first screen. To display the Operation Mode for additional groups of twelve ports (13 – 24, 25 – 36, and 37 – 48), use the arrow keys to highlight the Ports **[xx-xx]** field and press ENTER.

2. Press the SPACE bar until the appropriate mode, **FULL DUPLEX** or **STANDARD ENET** displays in the field.
3. Use the arrow keys to highlight the **SAVE** command on the bottom line of the screen.
4. Press ENTER. The message “SAVED OK” displays.

To set the Operation Mode for all ports (1-24, or higher), proceed as follows:

1. Use the arrow keys to highlight the **SET ALL PORTS** field.
2. Press the SPACE bar until you see **FULL** or **STANDARD**.
3. Use the arrow keys to highlight the **SAVE** command on the bottom line of the screen.
4. Press ENTER. The message “SAVED OK” displays.

1.8 HIGH SPEED INTERFACE CONFIGURATION MENU SCREEN

NOTE

This High Speed Interface Configuration Menu screen does not display unless an optional interface module is installed: one or two Fast Ethernet Interface Modules, or High Speed Interface Module (HSIM), depending on what the host SmartSwitch supports.

The High Speed Interface Configuration Menu screen, Figure 1-9, applies to the Fast Ethernet Interface Modules and the High Speed Interface Module.

To access the High Speed Interface Configuration Menu screen from the Port Configuration Menu screen, use the arrow keys to highlight the **HIGH SPEED INTERFACE CONFIGURATION** menu item and press ENTER. The High Speed Interface Configuration Menu screen, Figure 1-9, displays.

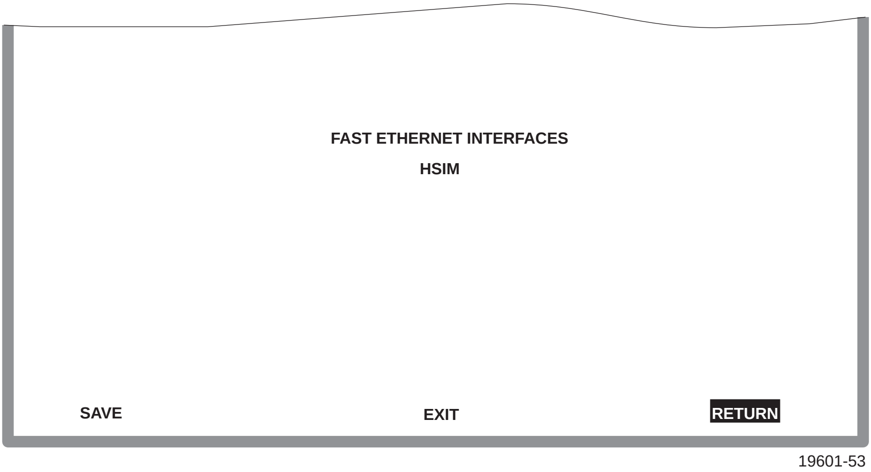


Figure 1-9 High Speed Interface Configuration Menu Screen

The following briefly explains each screen accessible from the High Speed Interface Configuration Menu screen.

FAST ETHERNET INTERFACES

Displays the types of fast Ethernet interfaces installed in the device, their current operating mode, and indicates if the ports are linked. This screen also allows the user to enable or disable Auto-Negotiation and set the Advertised Ability. For details, refer to Section 1.9.

HSIM

Displays the types of interfaces installed in the High Speed Interface Module (HSIM) slot. The HSIM screens are depicted in their respective user’s guides.

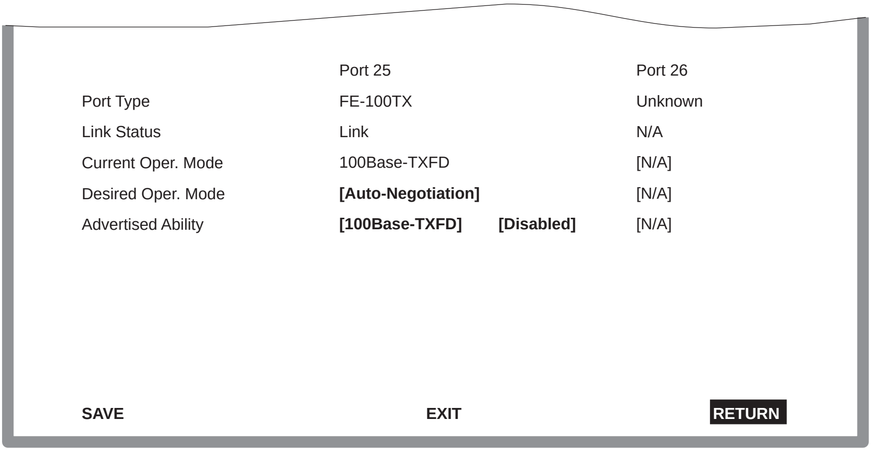
1.9 HIGH SPEED INTERFACE CONFIGURATION SCREEN

NOTE

The High Speed Interface Configuration screen, Figure 1-10, applies only to installed optional Fast Ethernet Interface Modules. This screen supports the FE-100TX, FE-100FX, FE-100F3, and FE-100LH Fast Ethernet Interface Modules that operate at 100 Mbps.

The High Speed Interface Configuration screen displays the types of installed Fast Ethernet Interface Modules, their current operating mode, and indicates if the ports are linked. This screen also allows the user to enable or disable Auto-Negotiation and set the Advertised Ability.

To access the High Speed Interface Configuration screen from the High Speed Interface Configuration Menu screen, use the arrow keys to highlight the **FAST ETHERNET INTERFACES** menu item and press ENTER. The High Speed Interface Configuration screen displays.



```
                         Port 25                           Port 26
Port Type                FE-100TX                          Unknown
Link Status              Link                              N/A
Current Oper. Mode       100Base-TXFD                      [N/A]
Desired Oper. Mode       [Auto-Negotiation]                [N/A]
Advertised Ability       [100Base-TXFD]     [Disabled]     [N/A]



SAVE                              EXIT                     RETURN
```

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Figure 1-10 High Speed Interface Configuration Screen

The following briefly explains each field of the High Speed Interface Configuration screen.

Port Type (Read-only)

Displays the type of interface (FE-100FX, FE-100TX, FE-100F3, FE-100LH, or Unknown) installed. Figure 1-10 shows that there is an FE-100TX interface installed in one optional port slot and no interface indicated by Unknown in another optional port slot. This example does not apply to all devices because the number of ports vary, depending on the SmartSwitch model.

Link Status (Read-only)

Indicates whether or not there is a physical connection from this port to another 10BASE-T or 100BASE-TX/FX device. One of the following values displays:

- **Link –** There is a link signal present and a valid physical connection to another device.
- **No Link –** There is no link signal present and no valid physical connection to another device.

Current Oper. Mode (Read-only)

This field displays the current operating mode of interfaces installed in the optional port slot(s). Depending on whether a 100BASE-FX, or 100BASE-TX is installed, this field displays the following:

- With a 100BASE-FX interface: 100Base-FX, 100Base-FXFD (full duplex), or N/A when port is empty.
- With a 100BASE-TX interface: Unknown, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, 100Base-TXFD (full duplex) or N/A when port is empty.

Desired Oper. Mode (Selectable)

This field allows the user to select the desired operational mode for an interface in one of the optional port slots. The field toggles between 100BASE-FX and 100BASE-FXFD (full duplex) when an FE-100FX or FE-100F3 is installed. Section 1.9.1 describes how to configure a port with an FE-100FX or FE-100F3.

NOTE

In normal operation, the port with an FE-100TX installed automatically establishes a link with the device at the other end of the segment without requiring user setup. However, Local Management provides the user with the option of manually configuring that port.

If an FE-100TX is installed, the field steps to Auto-Negotiation, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, and 100Base-TXFD (full duplex). In normal operation, the port with an FE-100TX installed is capable of auto-negotiating the operational mode and no further user setup is required. Section 1.9.3 describes how to manually configure an FE-100TX.

In Auto-Negotiation, the FE-100TX negotiates to the highest common denominator of the two interfaces. The order of priority of negotiation is 100BASE-TXFD, 100BASE-TX, 10BASE-TFD, and 10BASE-T.

Advertised Ability (Selectable)

During auto-negotiation, the FE-100TX “tells” the device at the other end of the segment about its capabilities. The capabilities of a port with an FE-100TX installed are 10Base-T, 10Base-TFD (full duplex mode), 100Base-TX and 100Base-TXFD (full duplex mode). In normal operation, with all capabilities enabled, the FE-100TX “advertises” that it has the ability to operate in any mode. The Network Manager (or user) may choose to set up the port so that only a portion of the available capabilities are advertised and the others are disabled. For example, only 100Base-TX and 100Base-TXFD might be enabled so that only devices that operate at 100 Mbps can communicate with that port. Section 1.9.5 describes how to enable or disable advertised modes.

1.9.1 Configuring an FE-100FX or FE-100F3

When an FE-100FX or FE-100F3 is installed, it must be manually set to operate in the same technology as the device at the other end of the connected segment. Section 1.9.2 provides instructions for manually configuring the port with an FE-100FX or FE-100F3 interface.

1.9.2 Setting the FE-100FX or FE-100F3 Operational Mode

Use this field to set the active technology. This field toggles between 100Base-FX and 100Base-FXFD (full duplex). To set the active technology through Local Management, proceed as follows:

1. Use the arrow keys to highlight the **Desired Operational Mode** field.
2. Use the SPACE bar to select **100Base-FX** or **100Base-FXFD** (full duplex).
3. Press ENTER. The port now operates in the chosen mode.
4. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message “SAVED OK” displays and Local Management saves the changes to memory.

1.9.3 Configuring an FE-100TX

In normal operation, an FE-100TX interface automatically establishes a link with the device at the other end of the segment and no user setup is required. Section 1.9.4 and Section 1.9.5 provide instructions for manually configuring the port with an FE-100TX installed.

1.9.4 Setting the FE-100TX Operational Mode

Use this field to set the active technology. This field steps between Auto-Negotiation, 10Base-T, 10Base-TFD (full duplex), 100Base-TX, and 100Base-TXFD (full duplex). If Auto-Negotiation is selected, the FE-100TX automatically sets the active technology.

To manually set the active technology through Local Management, proceed as follows:

1. Use the arrow keys to highlight the **Desired Oper. Mode** field.
2. Use the SPACE bar to select the desired mode. Press ENTER. If any mode other than Auto-Negotiation is selected, the port only operates in the chosen mode and Auto-Negotiation is disabled.

3. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message “SAVED OK” displays and Local Management saves the changes to memory. The selected mode is displayed in both the Desired Operational Mode field and the Current Operational Mode field.

1.9.5 Setting the FE-100TX Advertised Ability

In normal operation, an FE-100TX auto-negotiates to the highest speed possible. Under some circumstances, the Network Administrator may want the port to advertise only some of the available modes and not advertise in other modes. This field steps to 10Base-T, 10Base-TFD (full duplex), 100Base-TX, and 100Base-TXFD (full duplex). To set the advertised ability, proceed as follows:

1. Use the arrow keys to highlight the **Desired Oper. Mode** field.
2. Use the SPACE bar to select the desired mode.
3. Use the LEFT-ARROW key to move back to the **Advertised Ability** selection and use the SPACE bar to select the next mode to enable or disable.
4. Use the RIGHT-ARROW key to move across to the **Enabled/Disabled** field to the right of the selection.
5. Use the SPACE bar to select **Enabled** or **Disabled**. Press ENTER. Continue this process until you have completed enabling or disabling the advertised modes.
6. Use the arrow keys to highlight the **SAVE** command. Press ENTER. The message “SAVED OK” displays and Local Management saves the changes to memory.

1.10 REDIRECT CONFIGURATION MENU SCREEN

The Redirect Configuration Menu screen (Figure 1-11) provides access to the Port Redirect Configuration and VLAN Redirect Configuration screens. Any combination, up to 128, of port and/or VLAN redirect instances can be configured.

To access the Redirect Configuration Menu screen from the Port Configuration Menu screen, use the arrow keys to highlight the **PORT REDIRECT CONFIGURATION** menu item and press ENTER. The Redirect Configuration Menu screen displays.

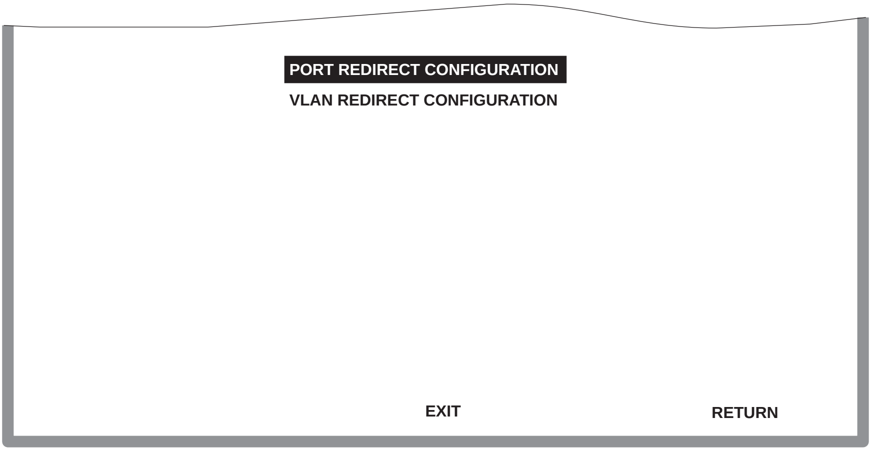


Figure 1-11 Redirect Configuration Menu Screen

The following defines each selectable item of the Redirect Configuration Menu screen:

PORT REDIRECT CONFIGURATION

The Port Redirect Configuration screen is used to redirect traffic from a source switch port to a destination switch port. For details, refer to Section 1.11.

VLAN REDIRECT CONFIGURATION

The VLAN Redirect Configuration screen is used to configure the device to direct traffic from a VLAN to a particular switch port. For details, refer to Section 1.12.

1.11 PORT REDIRECT CONFIGURATION SCREEN

The Port Redirect Configuration screen, Figure 1-12, enables the user to redirect frames from one source port to one destination port. Frames received on the source port can be redirected and transmitted in the frame format in which they are received (normal), or they can be redirected with a VLAN Tag (TAGGED) or without a VLAN Tag (UNTAGGED). Also, any errored frames received can be either dropped or forwarded to the destination port. For example, port 1 can be set as the source port with port 2 as the destination port. Frames from port 1 are then automatically redirected to port 2 according to the configured frame format, and frames with errors can be either forwarded or dropped according to the screen settings.

NOTE

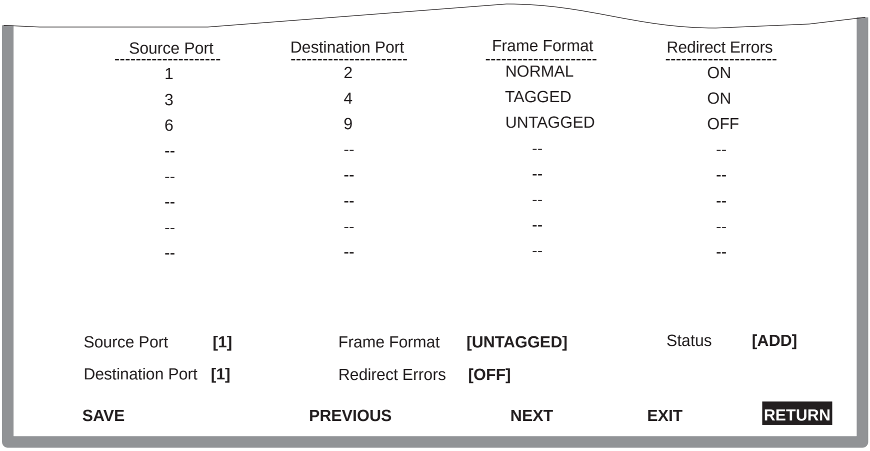
If an optional ATM interface is installed, up to 128 ports may be set to redirect frames. This includes ATM Port Virtual Channels (PVCs).

The port redirect function is very useful for troubleshooting purposes, as it allows traffic to be sent to a particular port where, with the use of an analyzer or RMON probe, all current traffic from the source port can be examined.

NOTE

Although all traffic from the source port (including, if desired, errored frames) is sent to the destination port, normal switching is still performed for all frames on the source port.

To access the Port Redirect Configuration screen from the Redirect Configuration Menu screen, use the arrow keys to highlight the **PORT REDIRECT CONFIGURATION** menu item and press ENTER. The Port Redirect Configuration screen displays.



```
    Source Port          Destination Port        Frame Format          Redirect Errors
 ------------------    --------------------    -------------------    -------------------
         1                     2                   NORMAL                   ON
         3                     4                   TAGGED                   ON
         6                     9                   UNTAGGED                 OFF
        --                    --                     --                     --
        --                    --                     --                     --
        --                    --                     --                     --
        --                    --                     --                     --
        --                    --                     --                     --


 Source Port        [1]        Frame Format      [UNTAGGED]        Status      [ADD]

 Destination Port   [1]        Redirect Errors   [OFF]
```

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Figure 1-12 Port Redirect Configuration Screen

The following definitions briefly explain each field of the Port Redirect Configuration screen:

Source Port (Read-Only)

Shows which ports are currently set as source ports.

Destination Port (Read-Only)

Shows which ports are currently set as destination ports.

NOTE

Only one destination port may be assigned to a source port.

Frame Format (Read-Only)
Displays the current frame format setting: NORMAL, TAGGED or UNTAGGED The default is NORMAL.

- NORMAL – Frames are redirected in the format that they were received or transmitted on the source port.
- TAGGED – Frames are transmitted on the destination port with a VLAN tag inserted according to the frame classification.
- UNTAGGED – Frames are transmitted on the destination port without a VLAN tag regardless of the format of the received frame.

Redirect Errors (Read-Only)
Displays whether the corresponding source ports are configured ON to send errored frames to the destination ports, or OFF to drop all errored frames and only forward valid frames to the destination ports. All redirected error frames display in the way they were received or transmitted on the source port, regardless of the frame format setting.

Source Port [*n*] (Selectable)
Used to select the port [*n*] that is to be changed to a source port. If a port is currently being redirected, it will not display as a selectable port. For details, refer to Section 1.11.1.

Destination Port [*n*] (Selectable)
Used to select the port [*n*] that is to be changed to a destination port. If a port is currently being redirected, it will not display as a selectable port. For details, refer to Section 1.11.1.

Frame Format (Selectable)
Used to select the frame format for the transmission of redirected frames on the destination port. NORMAL, TAGGED, or UNTAGGED may be selected. Refer to the previously described read-only Frame Format field for details about each format. The default setting is NORMAL.

Redirect Errors (Toggle)
Used to set each source port to either ON, to send errored frames to its destination port, or OFF to drop errored frames, and send only valid traffic to its destination port. The default setting is OFF.

Status (Toggle)
Used to add or delete source and destination ports selected in the Source Port [*n*] and Destination Port [*n*] fields.

1.11.1 Changing Source and Destination Ports

To add or delete source port and destination port entries and set the Frame Format and Redirect Errors functions, proceed as follows:

1. Use the arrow keys to highlight the **Source Port** field near the bottom of the screen.
2. Press the SPACE bar or BACKSPACE one or more times to increment or decrement the port number displayed in the brackets [*n*] until the appropriate port number displays.
3. Use the arrow keys to highlight the **Destination Port** field near the bottom of the screen.
4. Use the SPACE bar or BACKSPACE to step to the appropriate port number for the destination port.
5. Use the arrow keys to highlight the **Frame Format** field near the bottom of the screen.
6. Use the SPACE bar or BACKSPACE to step to the appropriate frame format setting (**NORMAL**, **TAGGED**, or **UNTAGGED**) for the selected Destination Port.
7. Use the arrow keys to highlight the **Redirect Errors** field near the bottom of the screen.
8. Use the SPACE bar to select either the **ON** or **OFF** option and press ENTER. **ON** forces the source port to forward errored frames to the destination port(s). **OFF** forces the errored frames to be dropped before forwarding traffic.
9. Use the arrow keys to highlight the **Status** field.
10. Use the SPACE bar to select either the **ADD** or **DEL** (delete) option. Press ENTER. This adds or deletes the selections for the Source Port, Destination Port, Frame Format, and Redirect Errors made in steps 1 through 8 and also updates the screen.

NOTE

A destination port can only be assigned to one source port.

TIP

If more than one port is being redirected, repeat steps 1 through 10 for each additional setting. Then go to step 11 to save all the new settings at once.

If an entry is to be changed, delete the entry, save the screen, then recreate the entry with its new settings.

Any combination, up to 128, of port redirect instances (configured on the Port Redirect Configuration screen) and/or VLAN redirect instances (configured on the VLAN Redirect Configuration screen) can be configured.

11. Use the arrow keys to highlight **SAVE** at the bottom of the screen. Press ENTER. The message “SAVED OK” displays. This saves the new settings and updates the Source Port and Destination Port read-only fields.

1.12 VLAN REDIRECT CONFIGURATION SCREEN

The VLAN Redirect Configuration screen, Figure 1-13, enables the user to select a source VLAN identification (ID) and a destination port. For example, VLAN ID 1 can be set as the source VLAN with port 2 as the destination port. Traffic from VLAN 1 is then automatically redirected to port 2 according to the Frame Format setting for that source VLAN. The Frame Format setting determines the format in which the frames received belonging to the source VLAN are redirected to the destination port. The frames can be forwarded in the frame format as received, tagged, or untagged.

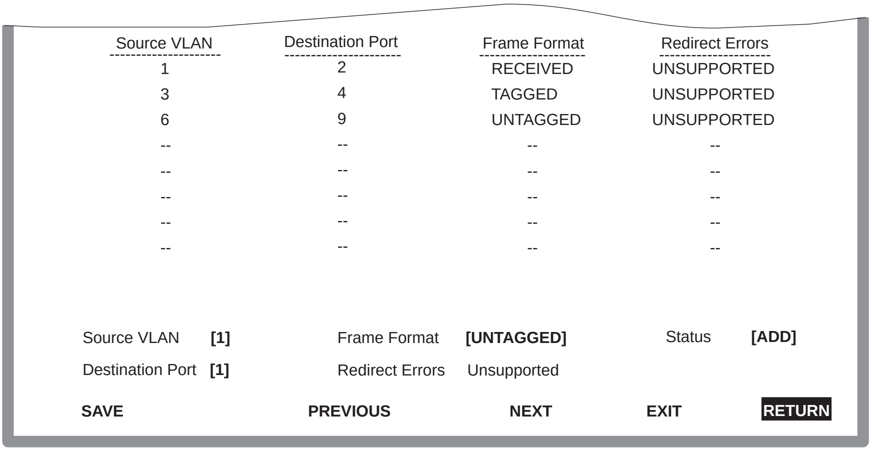
The VLAN redirect function is very useful for troubleshooting purposes. It allows traffic associated with a particular VLAN to be sent to a particular port where, with the use of an analyzer or RMON probe, all current traffic from the source VLAN can be examined.

NOTE

Although traffic associated with a particular VLAN is sent to the destination port, normal switching is still performed for all frames on the source port.

The Redirect Errors function is not supported on this screen.

To access the VLAN Redirect Configuration screen from the Redirect Configuration Menu screen, use the arrow keys to highlight the **VLAN REDIRECT CONFIGURATION** menu item and press ENTER. The VLAN Redirect Configuration screen displays.



Source VLAN	Destination Port	Frame Format	Redirect Errors
1	2	RECEIVED	UNSUPPORTED
3	4	TAGGED	UNSUPPORTED
6	9	UNTAGGED	UNSUPPORTED
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Source VLAN **[1]** Frame Format **[UNTAGGED]** Status **[ADD]**

Destination Port **[1]** Redirect Errors Unsupported

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Figure 1-13 VLAN Redirect Configuration Screen

The following definitions briefly explain each field of the VLAN Redirect Configuration screen:

Source VLAN (Read-Only)

Shows the VLAN ID of the VLANs that are currently set as source VLANs.

Destination Port (Read-Only)

Shows which ports are currently set as destination ports.

NOTE

Multiple VLANs may be assigned to a destination port.

The Redirect Errors function is not supported on this screen.

Frame Format (Read-Only)

Displays the current frame format setting: RECEIVED, TAGGED or UNTAGGED. The default is RECEIVED.

- RECEIVED – Frames are redirected in the format that they were received by the SmartSwitch device.
- TAGGED – Frames are transmitted on the destination port with a VLAN tag inserted according to the frame classification of the receiving port.
- UNTAGGED – Frames are transmitted on the destination port without a VLAN tag regardless of the format of the received frame.

Redirect Errors

Unsupported.

Source VLAN [*n*] (Modifiable)

Used to enter the VLAN ID of the VLAN that is to be changed to a source VLAN. If a VLAN is currently being redirected, it will not display as a selectable VLAN. For details, refer to Section 1.11.1.

Destination Port [*n*] (Selectable)

Used to select the port number that is to be changed to a destination port. If a port is currently being redirected, it will not display as a selectable port. For details, refer to Section 1.11.1.

Frame Format (Selectable)

Used to select the frame format for the transmission of redirected frames on the destination port. RECEIVED, TAGGED, or UNTAGGED may be selected. Refer to the previously described read-only Frame Format field for details about each format. The default setting is RECEIVED.

Redirect Errors

Unsupported.

Status (Toggle)

Used to add or delete source and destination ports selected in the Source VLAN [*n*] and Destination Port [*n*] fields.

1.12.1 Changing Source VLAN and Destination Ports

To add or delete source VLAN and destination port entries and set the Frame Format, proceed as follows:

1. Use the arrow keys to highlight the **Source VLAN** field near the bottom of the screen.
2. Type in the VLAN ID number of the source VLAN to be configured.
3. Use the arrow keys to highlight the **Destination Port** field near the bottom of the screen.
4. Use the SPACE bar or BACKSPACE to step to the appropriate port number for the destination port.
5. Use the arrow keys to highlight the **Frame Format** field near the bottom of the screen.
6. Use the SPACE bar or BACKSPACE to step to the appropriate frame format setting (**RECEIVED**, **TAGGED**, or **UNTAGGED**) for the selected Destination Port.
7. Use the arrow keys to highlight the **Status** field.
8. Use the SPACE bar to select either the **ADD** or **DEL** (delete) option. Press ENTER. This adds or deletes the selections for the Source VLAN, Destination Port, and Frame Format made in steps 1 through 6 and also updates the screen.

NOTE

Multiple VLANs may be assigned to a destination port.

TIP

If more than one VLAN is being redirected, repeat steps 1 through 8 for each additional setting. Then go to step 9 to save all the new settings at once.

If an entry is to be changed, delete the entry, save the screen, then recreate the entry with its new settings.

Any combination, up to 128, of port redirect instances (configured on the Port Redirect Configuration screen) and/or VLAN redirect instances (configured on the VLAN Redirect Configuration screen) can be configured.

9. Use the arrow keys to highlight **SAVE** at the bottom of the screen. Press ENTER. The message “SAVED OK” displays. This saves the new settings and updates the Source Port and Destination Port read-only fields.

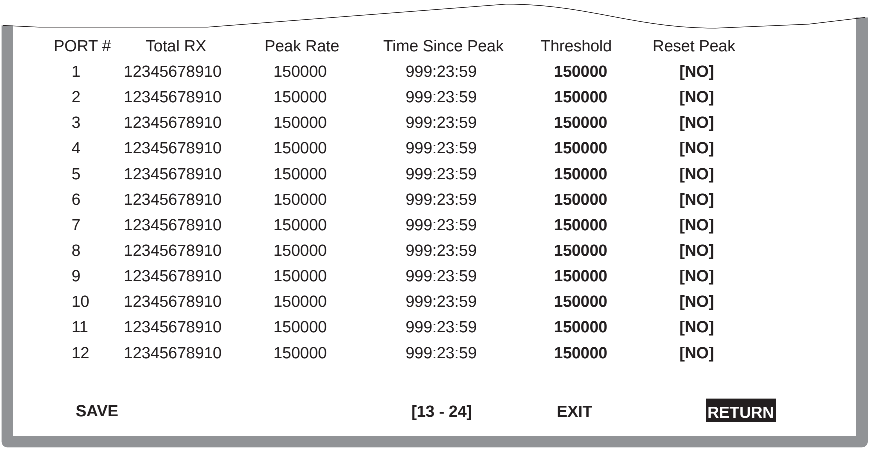
1.13 BROADCAST SUPPRESSION CONFIGURATION SCREEN

The Broadcast Suppression Configuration screen, Figure 1-14, enables the user to set a desired limit of receive broadcast frames that are switched out to the other ports.

NOTE

Broadcast frames received above the threshold setting are dropped.

To access the Broadcast Suppression Configuration screen from the Port Configuration Menu screen, use the arrow keys to highlight the **BROADCAST SUPPRESSION CONFIGURATION** menu item and press ENTER. The Broadcast Suppression Configuration screen displays.



PORT #	Total RX	Peak Rate	Time Since Peak	Threshold	Reset Peak
1	12345678910	150000	999:23:59	**150000**	**[NO]**
2	12345678910	150000	999:23:59	**150000**	**[NO]**
3	12345678910	150000	999:23:59	**150000**	**[NO]**
4	12345678910	150000	999:23:59	**150000**	**[NO]**
5	12345678910	150000	999:23:59	**150000**	**[NO]**
6	12345678910	150000	999:23:59	**150000**	**[NO]**
7	12345678910	150000	999:23:59	**150000**	**[NO]**
8	12345678910	150000	999:23:59	**150000**	**[NO]**
9	12345678910	150000	999:23:59	**150000**	**[NO]**
10	12345678910	150000	999:23:59	**150000**	**[NO]**
11	12345678910	150000	999:23:59	**150000**	**[NO]**
12	12345678910	150000	999:23:59	**150000**	**[NO]**

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Figure 1-14 Broadcast Suppression Configuration Screen

The following explains each field of the Broadcast Suppression screen:

PORT # (Read-Only)
Identifies the number of the port.

Total RX (Read-Only)
Displays the total number of broadcast frames received.

Peak Rate (Read-Only)
Displays the highest number of broadcast frames received in a one-second interval.

Time Since Peak (Read-Only)
Displays the time since peak rate was achieved.

Threshold (Modifiable)
Used to set the desired limit of receive broadcast frames that will be forwarded per port per second. For details on how to set the threshold, refer to Section 1.13.1.

Reset Peak (Toggle)
Used to reset the Peak Rate. Resetting the Peak Rate also resets the Time Since Peak field. The Reset Peak field toggles between YES and NO. For details, refer to Section 1.13.2.

1.13.1 Setting the Threshold

To set the Threshold, proceed as follows:

1. Use the arrow keys to highlight the **Threshold** field for the selected port.
2. Type in the numbers for the desired limit. Only enter values in increments of ten (for example: 10, 20, 30, etc.).
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

[13 - 24] (Navigation Key)
When the Switch Configuration screen displays, the current screen settings are displayed for the first 12 ports. This field is used to step to the next screen for the same type of information for the next twelve ports, if available. (The number of ports available is dependent on the SmartSwitch model.) To navigate to the next screen, highlight the **[xx-xx]** field and press ENTER. The user can change the field settings while in any of the selected screens.

1.13.2 Resetting the Reset Peak

To reset the peak level of the broadcast traffic, proceed as follows:

1. Use the arrow keys to highlight the **Reset Peak** field for the selected port.
2. Press the SPACE bar to select **YES** or **NO**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays and the Time Since Peak field is also reset.

1.14 REPEATER CONFIGURATION MENU SCREENS

The Repeater Configuration Menu screen and its subordinate security screens are only displayed when using the repeater device 2E43-51, 2E43-51R, 2H23-50R, or 2H33-37R. The screens that will display depend on the repeater device.

In the 2E43-51and 2E43-51R devices, the screens are the Repeater Level Security Configuration and Port Level Security Configuration screens.

In the 2H23-50R and 2H33-37R devices, the screens are the Repeater Configuration Menu screen and its two subordinate screens, Repeater Level Security Configuration and Port Level Security Configuration screens.

For a description of the screens associated with the 2E43-51 and 2E43-51R devices, refer to Chapter 2; for the 2H23-50R and 2H33-37R devices, refer to Chapter 3. The screens enable the user to configure operations and security at the connector and port level.

1.15 802.1 CONFIGURATION MENU SCREEN

The 802.1 Configuration Menu screen, Figure 1-15, provides access to the Switch Configuration, 802.1Q VLAN Configuration Menu, GARP Operation Status, GMRP Group Registrations, and 802.1p Priority Configuration Menu screens.

To access the 802.1 Configuration Menu screen from the Device Configuration Menu screen, use the arrow keys to highlight the **802.1 CONFIGURATION MENU** item and press ENTER. The 802.1 Configuration Menu screen displays.

NOTE

When the SmartSwitch is operating in the 802.1D switching mode, SWITCH CONFIGURATION is the only menu item that displays.

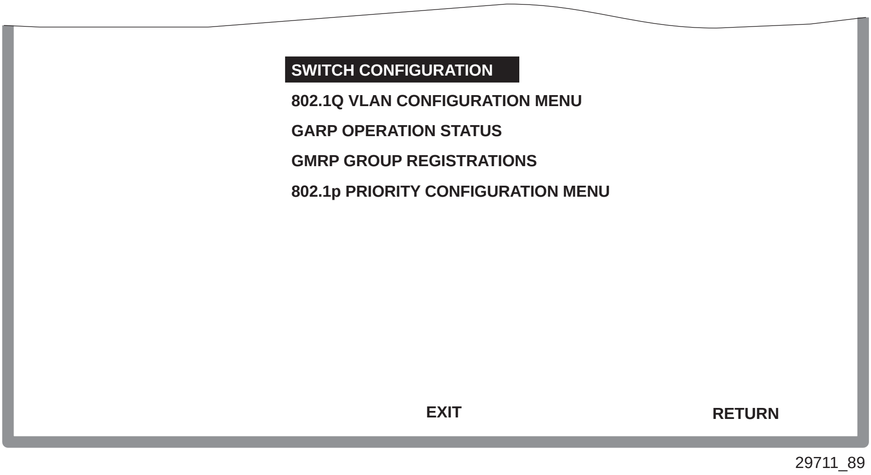


Figure 1-15 802.1 Configuration Menu Screen

The following briefly describes each screen that is accessible from the 802.1 Configuration Menu screen.

SWITCH CONFIGURATION

Provides the basic setup options for customizing the operation of a switch device in the network. For details, refer to Section 1.16.

802.1Q VLAN CONFIGURATION MENU

Displays only if the SmartSwitch has been configured to operate as an IEEE 802.1Q switch. When selected, this menu item opens the 802.1Q VLAN Configuration Menu screen.

The IGMP/VLAN Configuration screen has been added to the 802.1Q VLAN Configuration Menu screen. The revised menu screen is shown in this supplement along with a description of how to use the IGMP/VLAN Configuration screen. Refer to Section 1.19 for details.

For details about the other VLAN Local Management screens and how to use them to configure VLANs in the SmartSwitch, refer to the Cabletron Systems *802.1Q VLAN User's Guide*.

GARP OPERATION STATUS

Used to enable/disable GVRP and GMRP on the switch and set each port to operate as a GVRP- or GMRP-aware port so it can send/receive frames from other GVRP- or GMRP-aware devices. GVRP and GMRP enables the switch to dynamically create VLANs and Multicast Registration across a switched network. For more information about GVRP and GMRP, refer to Section 4.1.

For details about the GARP Configuration screen, refer to Section 4.3.

GMRP GROUP REGISTRATIONS

Used to select individual ports or all of the ports and apply one of four modes of operation according to, or regardless of, multicast address registration. For more information about GVRP and GMRP, refer to Section 4.1.

For details about the GMRP Group Registrations/GMRP Configuration screen, refer to Section 4.1.

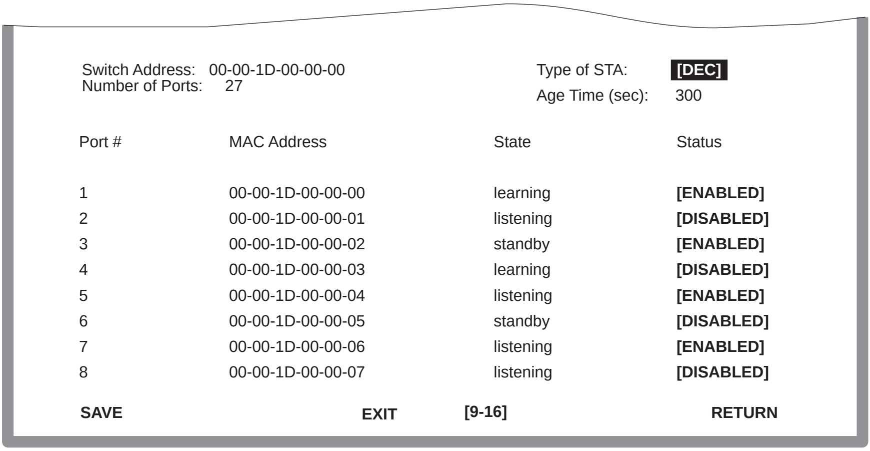
802.1p PRIORITY CONFIGURATION

Used to select the Priority/Multicast Configuration Menu screen, which in turn enables the selection of the Port Priority Configuration and Advanced Port Priority Configuration screens. For details, refer to Section 1.20.

1.16 SWITCH CONFIGURATION SCREEN

The Switch Configuration screen, Figure 1-16, provides the basic setup options to make a switch operational in your network.

To access the Switch Configuration screen from the 802.1 Configuration Menu screen, use the arrow keys to highlight the **SWITCH CONFIGURATION** menu item and press ENTER.



```
Switch Address:   00-00-1D-00-00-00                    Type of STA:       [DEC]
Number of Ports:    27
                                                       Age Time (sec):    300

Port #          MAC Address                 State              Status

1               00-00-1D-00-00-00           learning           [ENABLED]
2               00-00-1D-00-00-01           listening          [DISABLED]
3               00-00-1D-00-00-02           standby            [ENABLED]
4               00-00-1D-00-00-03           learning           [DISABLED]
5               00-00-1D-00-00-04           listening          [ENABLED]
6               00-00-1D-00-00-05           standby            [DISABLED]
7               00-00-1D-00-00-06           listening          [ENABLED]
8               00-00-1D-00-00-07           listening          [DISABLED]
```

Figure 1-16 Switch Configuration Screen

The following describes each field of the Switch Configuration screen:

Switch Address (Read-Only)

Displays the MAC address of the SmartSwitch device.

Number of Ports (Read-Only)

Displays the total number of switched ports on the SmartSwitch device.

Type of STA (Toggle)

Allows the user to set the method that the switches use to decide which switch is the controlling (Root) switch when two or more switches exist in parallel (Spanning Tree Algorithm). Valid entries include IEEE, DEC, and NONE. To set the STA, refer to Section 1.16.1.

Age Time (Modifiable)

Allows the user to set the amount of time (in seconds) that the SmartSwitch keeps an address in its switch table before discarding it. An address is automatically discarded when a valid frame is not received from that address within the time specified in the Age Time field. To change the Age Time field from the default value of 300 seconds, refer to Section 1.16.2.

Port # (Read-Only)

Lists each switched port on the device. If the number of ports is greater than eight, then the additional ports are listed on subsequent screens.

MAC Address (Read-Only)

Displays the base hardware address assigned to each listed port.

State (Read-Only)

Disabled: Management disabled this interface. No traffic is received or forwarded while the interface is disabled.

- Listening – The switch is not adding information to the Transparent Database. The switch is monitoring BPDU traffic while preparing to move from the learning to the forwarding state.
- Learning – The switch is learning the addresses on this interface. The switch enters the learning state when the Transparent Database is created (during start-up or after being deleted), or when the Spanning Tree Algorithm detects a network topology change.
- Forwarding – The switch is operating and this interface is forwarding traffic.
- Standby – This interface will not forward any traffic through the switch because a loop condition has been detected by the STA.

Status (Toggle)

Allows the user to enable or disable a port by setting the status of the listed interface to either ENABLED or DISABLED. To set the port status, refer to Section 1.16.3.

[1-8], [9-16], [17-24], [25-32], [33-40], or [41-48] (Navigation Key)
When the Switch Configuration screen displays, the current screen settings are displayed for the first 8 ports. This field is used to step to another screen for the same type of information for ports 9 through 16, 17 through 24, 25 through 32, 33 through 40, and 41 through 48, if available. (The number of ports available is dependent on the SmartSwitch model.) To navigate to the next screen, highlight the **[xx-xx]** field and press ENTER. The user can change the field settings while in any of the selected screens.

1.16.1 Setting the STA

The Spanning Tree Algorithm (STA) setting allows the user to set the method that the switches use to decide which is the controller (Root) switch when two or more switches are in parallel. The available selections are IEEE, DEC, and NONE.

To set the STA, proceed as follows:

1. Use the arrow keys to highlight the **Type of STA** field.
2. Use the SPACE bar to step to the appropriate setting (**IEEE**, **DEC**, or **NONE**).
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

1.16.2 Setting the Age Time Field

To set the Age Time, proceed as follows:

1. Use the arrow keys to highlight the **Age Time** field.
2. Type in the desired Age Time in increments of 10. The available Age Time range is 10 to 1,000,000 seconds with the default value being 300 seconds.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

1.16.3 Setting (Enabling or Disabling) the Port Status

To set the status of an interface (port), proceed as follows:

1. Use the arrow keys to highlight the **Status** field of the port.
2. Use the SPACE bar to toggle to either **ENABLED** or **DISABLED**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays.

1.17 SUMMARY OF VLAN LOCAL MANAGEMENT

The VLAN configuration process is an extension of normal Local Management operations. A series of Local Management screens provides access to the functions and commands necessary to add, change, or delete VLANs and to assign ports to those VLANs. The IGMP/VLAN Configuration screen has been added to the SmartSwitch device to enable the operation of IGMP on selected VLANs.

A switch supporting 802.1Q VLANs provides the VLAN Configuration screens as a standard part of its Local Management hierarchy when the switch is configured to operate in 802.1Q Mode. The hierarchy of the Local Management screens pertaining to 802.1Q VLAN configuration is shown in Figure 1-17. This supplement shows the revised hierarchy (Figure 1-17) and 802.1Q VLAN Configuration Menu screen (Figure 1-18), and describes how to use the IGMP/VLAN Configuration screen (Figure 1-19). For information concerning the other VLAN screens, refer to the *802.1Q VLAN User’s Guide* (P/N 9032599-02).

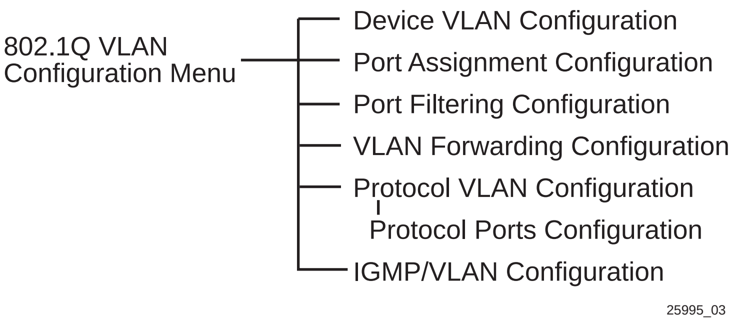
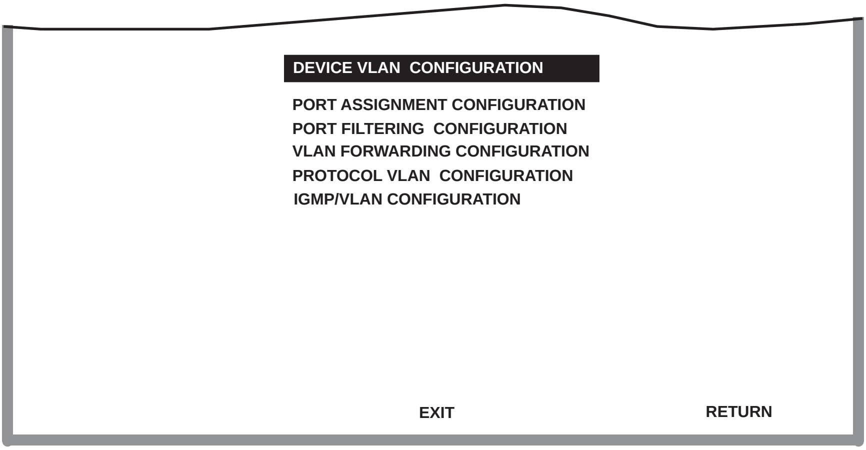

802.1Q VLAN
Configuration Menu
Device VLAN Configuration
Port Assignment Configuration
Port Filtering Configuration
VLAN Forwarding Configuration
Protocol VLAN Configuration
Protocol Ports Configuration
IGMP/VLAN Configuration
25995_03

Figure 1-17 802.1Q VLAN Screen Hierarchy

1.18 802.1Q VLAN CONFIGURATION MENU SCREEN

To access the 802.1Q VLAN Configuration Menu screen from the 802.1 VLAN Configuration Menu screen, use the arrow keys to highlight the **802.1Q VLAN CONFIGURATION MENU** item and press ENTER. The 802.1Q VLAN Configuration Menu screen, Figure 1-18, displays.



DEVICE VLAN CONFIGURATION
PORT ASSIGNMENT CONFIGURATION
PORT FILTERING CONFIGURATION
VLAN FORWARDING CONFIGURATION
PROTOCOL VLAN CONFIGURATION
IGMP/VLAN CONFIGURATION

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Figure 1-18 802.1Q VLAN Configuration Menu Screen

The following describes the screen menu items:

DEVICE VLAN CONFIGURATION

Used to view, add, name, enable, or disable VLANs within the device, and also associate the VLANs to a Filter Database ID (FID). It also enables the user to configure attributes that apply to the entire switch and/or VLANs. Refer to your SmartSwitch device user’s guide for additional information.

PORT ASSIGNMENT CONFIGURATION

Displays a list of ports and enables the user to assign a Port VLAN ID (PVID) to each port. The screen also allows the user to change the operational mode of a port. Refer to your SmartSwitch device user’s guide for additional information.

PORT FILTERING CONFIGURATION

Used to set the switch to filter out inbound frames to prevent them from being forwarded by the switch out a particular port. This screen also lists the VLANs that have frames eligible to be transmitted out that port. Refer to your SmartSwitch device user's guide for additional information.

VLAN FORWARDING CONFIGURATION

Used to view which ports are included in the VLAN's Forwarding List and whether to include a Tag Header in a frame being transmitted. Refer to your SmartSwitch device user's guide for additional information.

PROTOCOL VLAN CONFIGURATION

Used to assign VLAN IDs to protocol types of received frames and to access the Protocol Ports Configuration screen to add or delete transmitting ports associated with a specific VLAN ID and protocol type. Refer to your SmartSwitch device user's guide for additional information.

IGMP/VLAN CONFIGURATION

Used to enable or disable IGMP (Internet Group Management Protocol) on selected VLANs. For details, refer to Section 1.19.

1.19 IGMP/VLAN CONFIGURATION SCREEN

The IGMP/VLAN Configuration screen, Figure 1-19, is used to enable or disable IGMP (Internet Group Management Protocol, RFC 2236) on selected VLANs.

IGMP provides a solution for handling multicast streams in layer 2 switching devices. IGMP is for hosts on multi-access networks to inform locally attached switches of their Multicast group membership information. This is performed by hosts multicasting IGMP Host Membership Reports. Multicast switches listen for these messages and then pass them to the routers. This allows distribution trees to be formed to deliver multicast datagrams.

Information from the IGMP packets is used to send the multicast stream only to the end stations that request it.

IGMP is enabled or disabled by VLAN, not port by port.

NOTE

Certain versions of firmware will not allow the switch to be a querier. Please check your release notes for further information. Refer to RFC 2236, Section 8, for more information on IGMP.

The following multicast routing protocols are transparently supported and are used only to detect the location of the routers (see the Release Notes for any changes or additions to this list):

- DVMRP (Distance Vector Multicast Routing Protocol, RFC 1075)
- PIM (Protocol Independent Multicast) version 1 and 2
- CBT (Core Based Trees)
- MOSPF (Multicast OSPF, RFC 1583)

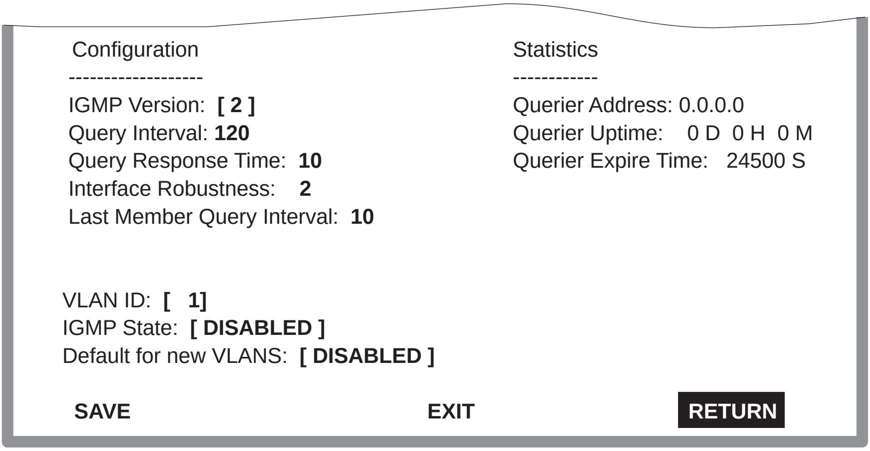
For additional information about IGMP, refer to Appendix A.

NOTE

The IGMP/VLAN Configuration screen does not display when the operational mode of the device is set to SECURE FAST VLAN.

Your SmartSwitch device user’s guide provides instructions for setting the operational mode.

To access the IGMP/VLAN Configuration screen from the Layer 3 Extensions Menu screen, use the arrow keys to highlight the **IGMP/VLAN CONFIGURATION** menu item and press ENTER. The IGMP/VLAN Configuration screen displays.



```
Configuration                                  Statistics
-------------------                            ------------
IGMP Version:  [ 2 ]                           Querier Address: 0.0.0.0
Query Interval: 120                            Querier Uptime:    0 D  0 H  0 M
Query Response Time:  10                       Querier Expire Time:   24500 S
Interface Robustness:    2
Last Member Query Interval:  10


VLAN ID:  [   1]
IGMP State:  [ DISABLED ]
Default for new VLANS:  [ DISABLED ]
```

Figure 1-19 IGMP/VLAN Configuration Screen

The following describes each field of the IGMP/VLAN Configuration screen:

IGMP Version (Toggle)
Displays the current configured IGMP version running on the VLAN selected in the VLAN ID field (version 1 or 2). The default is version 2. The IGMP Version field can be toggled to configure the switch in either version 1 or 2 to match the router configuration. For IGMP to function correctly, all switches on a LAN must be configured to run the same version of IGMP.

Query Interval (Modifiable)
If the switch is the querier, the value in the Query Interval field indicates how often IGMP Host-Query frames are transmitted on the VLAN selected in the VLAN ID field. This value is also used in calculations for other timers. The default value is 125 seconds. The range of possible entries is 1 to 300 seconds. An entry outside of the range will cause the error message “PERMISSIBLE RANGE: 1...300” to display in the Event Message field.

Query Response Time (Modifiable)

Used to enter the maximum query response time advertised in IGMPv2 general queries on this VLAN. This value is used in calculations for other timers. The default value is 10 seconds. The range of possible entries is 1 to 300 seconds. The value entered in this field cannot be bigger than the Query Interval.

Interface Robustness (Modifiable)

Allows tuning for the expected frame loss on a subnet. If a subnet is expected to be high loss, the Robustness Variable may be increased. IGMP is robust to (Robustness Variable-1) packet losses. This value is used in calculations for other timers. The default value is 2.

TIP

If the Interface Robustness is adjusted higher than the default value, depending on the network, this may be an indication of problems with the network that need to be resolved.

Last Member Query Interval (Modifiable)

Displays the Max Response Time inserted into Group-Specific Queries sent in response to the Leave Group messages, and is also the amount of time between Group-Specific Query messages. This value may be tuned to modify the leave latency of the network. A reduced value results in reduced time to detect the loss of the last member of a group. The interval is in tenths of seconds. This value is not used if the switch is not the querier.

Querier Address (Read-Only)

Displays the address of the IGMP Querier on the IP subnet to which this VLAN is attached.

Querier Uptime (Read-Only)

Displays the number of seconds that the current IGMP Querier has been operational since the last change in Queriers.

Querier Expire Time (Read-Only)

The number of seconds remaining before the Other Querier Present Timer expires. If the local system (current device displayed) is the querier, the value of this object is zero.

VLAN ID (Selectable)
Displays the Identifying number for the VLANs available to be modified. The information under Configuration and Statistics applies only to this VLAN ID number. Use the SPACE bar to step through all available VLAN IDs.

IGMP State (Selectable)
Displays the current state of the VLAN indicated in the VLAN ID field, which can be modified. Use the SPACE bar to step through the choices: ENABLED, DISABLED, ENABLE ALL, DISABLE ALL. The commands ENABLED and DISABLED will act only on the VLAN whose ID is in the VLAN ID field. The commands ENABLE ALL and DISABLE ALL act on all VLANs available to the switch.

Default for new VLANS (Toggle)
New VLANs can be set up by default to be either ENABLED or DISABLED. A VLAN is set up, by choosing the number for that VLAN

1.19.1 Configuring VLANs for IGMP

To set up IGMP protocol for VLANs, proceed as follows:

1. Use the arrow keys to highlight the **VLAN ID** field, and use the SPACE bar to toggle through the VLAN choices to find the correct VLAN to be configured. ALL may be chosen to affect all VLANs seen by the device.
2. Use the arrow keys to highlight the **IGMP State** field.
3. Use the SPACE bar to select **ENABLED**, **DISABLED**, **ENABLE ALL** or **DISABLE ALL**. ENABLED and DISABLED are used to enable or disable the VLAN chosen in step 1. ENABLE ALL and DISABLE ALL are used to enable or disable all available VLANs at one time.
4. Use the arrow keys to highlight the **Default for new VLANS** field.
5. Use the SPACE bar to toggle the setting to either **ENABLED** or **DISABLED** to set the default for new VLANs.

6. Use the arrow keys to highlight the **IGMP Version** field. Then use the SPACE bar to select the proper IGMP version for the VLAN shown in the VLAN ID field.

TIP When configuring IGMP, it is advisable to follow the IGMP configuration rules in RFC 2236 concerning switches and routers.

7. Use the arrow keys to highlight the remaining fields: **Query Interval**, **Query Response Time**, **Interface Robustness**, and **Last Member Query Interval**. Enter the desired numbers in each field.
8. Use the arrow keys to highlight the **SAVE** command and press the ENTER key to save the information in all the fields that were changed.

The event message line will indicate “SAVED OK” and the screen can now be exited. To set up a VLAN, refer to the Cabletron Systems *802.1Q VLAN User’s Guide*.

1.20 PRIORITY/MULTICAST CONFIGURATION MENU SCREEN

The Priority/Multicast Configuration Menu screen, Figure 1-20, provides access to the Port Priority Configuration, and Advanced Port Priority Configuration screens These screens are used for the following:

- Setting the default priority of frames received without a priority setting.
- Mapping the frame priorities to transmit queues for each front panel port. The number of ports is dependent on the SmartSwitch model.

NOTE The 802.1p Priority Configuration Menu item cannot be selected from the Port Priority Configuration screen when the operational mode of the device is set to 802.1D SWITCHING.

To access the Priority/Multicast Configuration Menu screen from the 802.1 Configuration Menu screen, use the arrow keys to highlight the **802.1p PRIORITY CONFIGURATION MENU** item and press ENTER. The Priority/Multicast Configuration Menu screen displays.

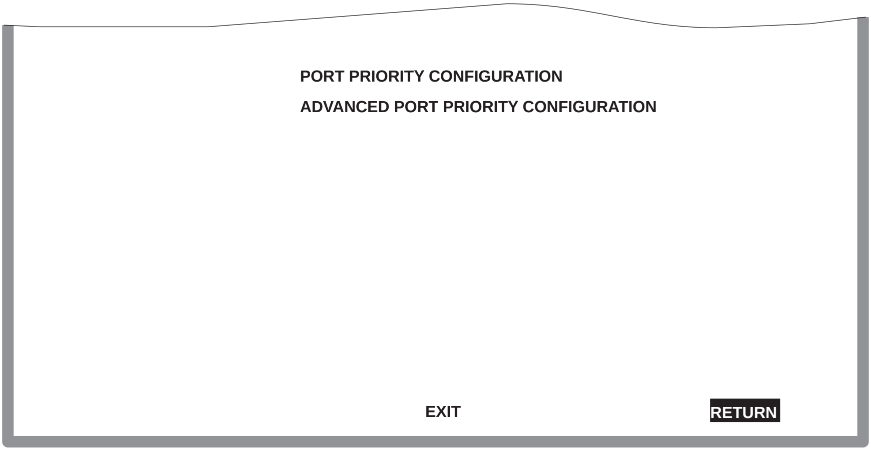

PORT PRIORITY CONFIGURATION
ADVANCED PORT PRIORITY CONFIGURATION
EXIT
RETURN

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Figure 1-20 Priority/Multicast Configuration Menu Screen

The Priority/Multicast Configuration Menu screen displays the following menu items:

PORT PRIORITY CONFIGURATION

Used to set the port default transmit priority (0 through 7) of each port for frames that are received without priority information in their tag header. For details, refer to Section 1.21.

ADVANCED PORT PRIORITY CONFIGURATION

Used to map priorities to transmit queues for each port. This screen is also used to change priority on a port by port basis and to reprioritize frames received in one priority so they can be transmitted at a different priority. For details, refer to Section 1.22.

1.21 PORT PRIORITY CONFIGURATION SCREEN

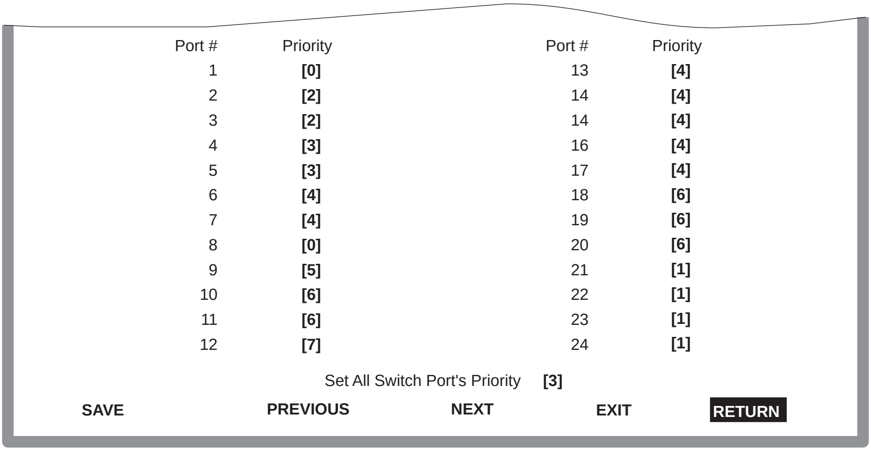
The Port Priority Configuration screen, Figure 1-21, is used to set the priority (0 through 7) on each port. A port receiving a frame without priority information in its tag header is assigned a priority according to the priority setting on the port. For example, if the priority of a port is set to 5, all frames received through that port without priority indicated in their tag header are classified as a priority 5.

A frame with priority information in its tag header is transmitted according to that priority.

NOTE

The Port Priority Configuration screen does not display when the operational mode of the device is set to 802.1D SWITCHING.

To access the Port Priority Configuration screen from the Priority/Multicast Configuration Menu screen, use the arrow keys to highlight the **PORT PRIORITY CONFIGURATION** menu item and press ENTER. The Port Priority Configuration screen displays.



Port #	Priority	Port #	Priority
1	[0]	13	[4]
2	[2]	14	[4]
3	[2]	14	[4]
4	[3]	16	[4]
5	[3]	17	[4]
6	[4]	18	[6]
7	[4]	19	[6]
8	[0]	20	[6]
9	[5]	21	[1]
10	[6]	22	[1]
11	[6]	23	[1]
12	[7]	24	[1]

Set All Switch Port's Priority [3]

Figure 1-21 Port Priority Configuration Screen

The following describes each field of the Port Priority Configuration screen:

Port # (Read-Only)
Lists each switched port on the device.

Priority (Selectable)
Used to select the transmit priority of frames received without the priority indicated in their tag header. A priority of 0 through 7 (with 0 being the lowest priority and 7 the highest) can be selected for each port. All ports are set to the default value of “0” when the device is initialized.

To set the transmit priority for each port, refer to Section 1.21.1.

Set All Switch Port’s Priority (Selectable)
Used to set all ports to one default transmit priority. A value of 0 through 7 (with 0 being the lowest priority and 7 the highest) can be selected that will apply to all ports. To set the default transmit priority for all ports, refer to Section 1.21.2.

1.21.1 Setting Switch Port Priority Port-by-Port

To set the default port priority on a particular port, proceed as follows:

1. Use the arrow keys to highlight the **Priority** field for the particular port.
2. Press the SPACE bar to step to the appropriate value: **0** through **7**.
3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
4. Press ENTER. The message “SAVED OK” displays and the setting is saved.

1.21.2 Setting Switch Port Priority on All Ports

To set the port priority on all ports, proceed as follows:

1. Use the arrow keys to highlight the **Set All Switch Port’s Priority** field.
2. Press the SPACE bar to select a priority from **0** through **7** (0 is the lowest priority).

3. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.

4. Press ENTER. The message “SAVED OK” displays and the setting is saved.

1.22 ADVANCED PORT PRIORITY CONFIGURATION SCREEN

The Advanced Port Priority Configuration screen, Figure 1-22, is used to set the Priority/Queue Mapping and Priority Regeneration for a particular port or change the default port priority. Priority/Queue Mapping is used to set the transmit (TX) queue (0 or 1, with 0 being the lowest level TX queue) for each frame priority.

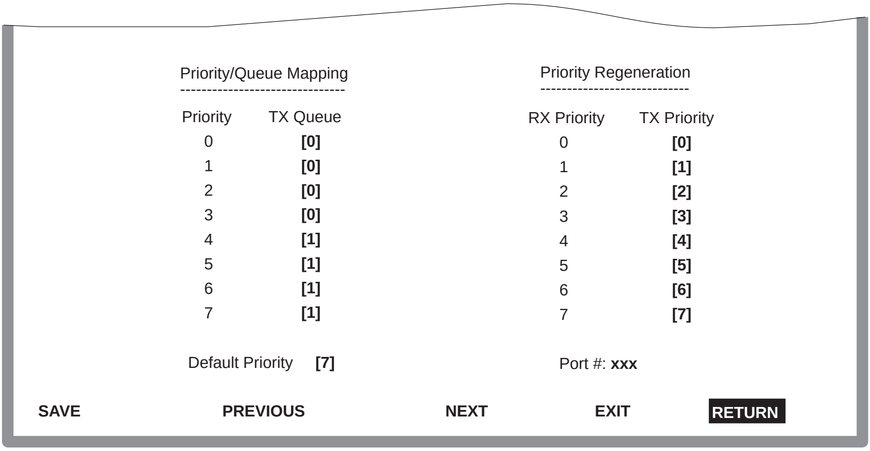
For example, if the TX queue is set to 1 for those frames with a priority 1, then those frames would be transmitted before any frames with a priority that has the TX queue set to 0.

Priority Regeneration is used to classify different types of traffic by reprioritizing received frames to a different transmit priority. For example, the frames associated with a particular type of traffic that have a received (RX) transmit priority, or a port default priority, of 3 could be changed to have a transmit priority of 5.

NOTE

The Advanced Port Priority Configuration screen does not display when the operational mode of the device is set to 802.1D SWITCHING.

To access the Advanced Port Priority Configuration screen from the Priority/Multicast Configuration Menu screen, use the arrow keys to highlight the **ADVANCED PORT PRIORITY CONFIGURATION** menu item and press ENTER. The Advanced Port Priority Configuration screen displays.



```
            Priority/Queue Mapping                     Priority Regeneration
            ------------------------------             ---------------------------

            Priority      TX Queue                   RX Priority      TX Priority
               0            [0]                           0               [0]
               1            [0]                           1               [1]
               2            [0]                           2               [2]
               3            [0]                           3               [3]
               4            [1]                           4               [4]
               5            [1]                           5               [5]
               6            [1]                           6               [6]
               7            [1]                           7               [7]

             Default Priority    [7]                    Port #: xxx

  SAVE                PREVIOUS                  NEXT          EXIT          RETURN
```

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Figure 1-22 Advanced Port Priority Configuration Screen

The following describes each field of the Advanced Port Priority Configuration screen:

Priority (Read-Only)
Lists the eight priorities, 0 through 7.

TX Queue (Toggle)
Enables the frames with a certain priority to be mapped to transmit according to one of two TX queues (0 or 1) with 0 being the lowest transmit level. Refer to Table 1-2 for the TX Queue default values according to frame priority.

Table 1-2 TX Queue Mapping Default Values

Priority	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
TX Queue	0	0	0	0	1	1	1	1

To set the TX Mapping Queues, refer to Section 1.22.1.

RX Priority (Read-Only)
Lists the eight priorities, 0 through 7.

TX Priority (Selectable)

Enables the frames with a certain RX priority to be changed to transmit according to a different TX priority (0 through 7).

The following describes how the frames of learned traffic are handled. When a frame is received, it is checked to see if it has a priority. If it does, it is forwarded to the appropriate output port. If it does not, the frame is assigned the default RX priority and then forwarded to the appropriate output port. At the output port, the RX priority of the frame is checked against the TX Regeneration table and may be transmitted at a different TX priority according to the table. For example, all frames with an RX priority of 3 could be regenerated with a TX priority of 5. The new value would also be inserted in the VLAN tag if the frame is tagged as outbound.

The regenerated priority is used to determine the correct queue as defined in the Priority/Queue Mapping. The default values for the TX Priority settings are listed in Table 1-3 according to RX priority.

Table 1-3 TX Priority Regeneration Default Values

RX Priority	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
TX Priority	0	1	2	3	4	5	6	7

To set the TX Regeneration Priorities, refer to Section 1.22.2.

Default Priority (Selectable)

Used to set the default port priority (0 through 7) of the port selected in the Port command. To set the default port priority, refer to Section 1.22.3.

Port # (Modifiable)

Used to enter the number of the port to be configured. Using an arrow key or pressing ENTER after entering a port number, causes the screen to refresh and show the current settings for that port.

1.22.1 Setting the TX Mapping Queues

To set the TX queue for frames with a particular priority, proceed as follows:

1. Use the arrow keys to highlight the **Port #** field.
2. Type in the number of the port to which the TX queue setting will be applied.
3. Use the arrow keys to highlight the **Default Priority** field. The screen refreshes and displays the current settings of the port in the Port # field.
4. Use the arrow keys to highlight the **TX Queue** field for the particular frame priority.
5. Press the SPACE bar to step to the appropriate value, **0** or **1**. The 0 selection is the lowest level TX queue.
6. If more than one TX queue is to be changed, repeat steps 4 and 5 until all the appropriate TX queue settings are changed.
7. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
8. Press ENTER. The message “SAVED OK” displays and the setting is saved.

1.22.2 Setting the TX Regeneration Priorities

To set the TX priority for frames with a particular RX priority, proceed as follows:

1. Use the arrow keys to highlight the **Port #** field.
2. Type in the number of the port to which the TX priority setting will be applied.
3. Use the arrow keys to highlight the **Default Priority** field at the bottom of the screen. The screen refreshes and displays the current settings of the port in the Port # field.
4. Use the arrow keys to highlight the **TX Priority** field for the particular RX frame priority.

5. Press the SPACE bar to step to the appropriate value, **0** through **7**. The 0 selection is the lowest level TX priority value.
6. If more than one TX priority is to be changed, repeat steps 4 and 5 until all the appropriate TX priority settings are changed.
7. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
8. Press ENTER. The message “SAVED OK” displays and the setting is saved.

1.22.3 Setting the Default Priority of a Port

To set the default port priority, proceed as follows:

1. Use the arrow keys to highlight the **Port #** field.
2. Type in the number of the port having the default priority changed.
3. Use the arrow keys to highlight the **Default Priority** field at the bottom of the screen. The screen refreshes and displays the current settings of the port in the Port # field.
4. Press the SPACE bar to step to the appropriate value, **0** through **7**. The 0 selection is the lowest level priority.
5. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
6. Press ENTER. The message “SAVED OK” displays and the setting is saved. This new setting will be reflected in the Port Priority Configuration screen the next time it is displayed.

CHAPTER 2

LM SECURITY SCREENS FOR 2E43-51/2E43-51R DEVICES

The information in this chapter replaces the information about the Repeater Configuration Menu and Repeater Port Configuration screens provided in the *2E43-51/2E43-51R SmartSwitch 2100 User's Guide*.

2.1 REPEATER CONFIGURATION MENU SCREEN

The Repeater Configuration Menu screen, Figure 2-1, is used to access the Repeater Level Security Configuration, or Port Level Security Configuration screen.

To access the Repeater Configuration Menu screen from the Port Configuration Menu screen, select the **REPEATER CONFIGURATION MENU** item and press ENTER. The Repeater Configuration Menu screen displays.

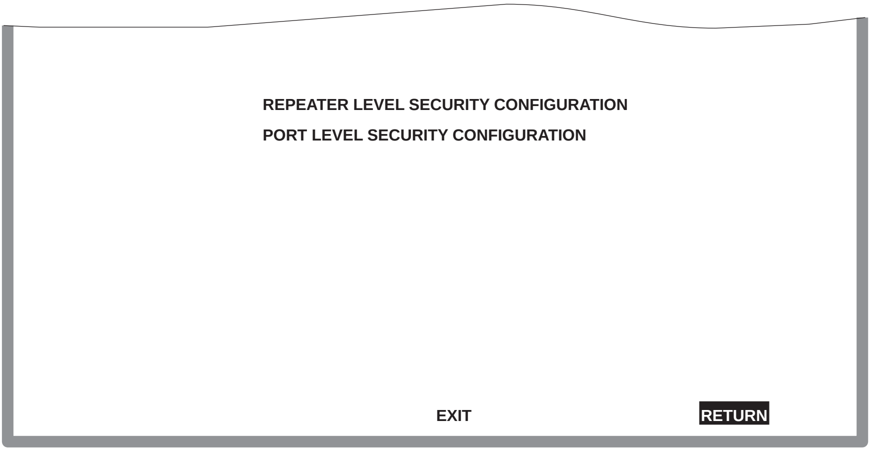

REPEATER LEVEL SECURITY CONFIGURATION
PORT LEVEL SECURITY CONFIGURATION
EXIT
RETURN
27462_104w

Figure 2-1 Repeater Configuration Menu Screen

The following introduces each screen that is accessible from the Repeater Configuration Menu screen.

REPEATER LEVEL SECURITY CONFIGURATION

Used to set the state of security of all ports on each connector, simultaneously. The ports can be set to receive all frames (NonSecure state), lock on the source address of the next frame received (LockOnNext), or lock on the address of the last frame received (LockedOnAddr). For details, refer to Section 2.2.

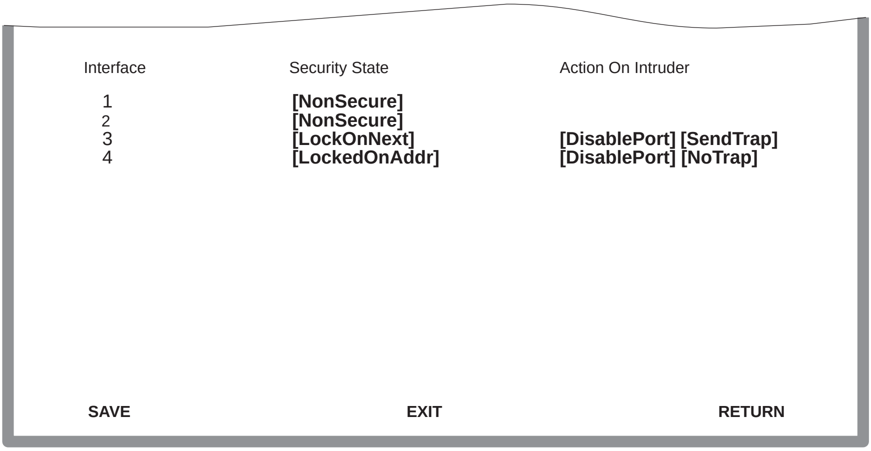
PORT LEVEL SECURITY CONFIGURATION

Used to set the security for each port of a connector, individually. For details, refer to Section 2.3.

2.2 REPEATER LEVEL SECURITY CONFIGURATION

The Repeater Level Security Configuration screen, Figure 2-2, is used to set the state of security according to connector. All ports on a connector can be set to receive all frames (NonSecure state), lock on the source address of the next frame received (LockOnNext), or lock on the source address of the last frame received (LockedOnAddr). When either of the last two options are set, the switch can be set to enable or disable the reception of frames and send or not send traps when an intruder is detected.

To access the Repeater Level Security Configuration screen, use the arrow keys to highlight the **REPEATER LEVEL SECURITY CONFIGURATION** menu item on the Repeater Configuration Menu screen and press ENTER. The Repeater Level Security Configuration screen displays.



```
     Interface                Security State                   Action On Intruder

        1                     [NonSecure]
        2                     [NonSecure]
        3                     [LockOnNext]                     [DisablePort] [SendTrap]
        4                     [LockedOnAddr]                   [DisablePort] [NoTrap]






     SAVE                                  EXIT                                   RETURN
```

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Figure 2-2 Repeater Level Security Configuration Screen

The following section defines the fields on the Repeater Level Security Configuration screen.

Interface (Read-Only)

Indicates the interface connector (ENET 1 through 4) selected in the Interface field.

Security State (Selectable)

Used to set all ports on an interface connector to the same security state. PortMismatch displays for an interface connector when all the ports on the interface connector are not set to the same state. The selectable states are as follows:

- NonSecure – Allows the ports on the connector to receive all frames. The source address of received frames is not examined and the frames are processed in a non-secure state.
- LockedOnAddr – The Security State of all ports on the specified interface connector are set to LockedOnAddr. This setting is for convenience, so that all ports on an interface connector can be set to LockedOnAddr at one time. Until the address is set at the port level, the port defaults to the locked on address of “00-00-00-00-00-00” as indicated by “XX-XX-XX-XX-XX-XX” in the address field shown in the Port Level Security Screen, see Figure 2-3.

The port will lock down on the address that is currently configured in the Port Level Security Configuration screen (if one is entered), or on the source address of the last received frame. When a port is locked on an address, the device executes the actions selected in the Action On Intruder field (Port Level Security Configuration screen) when a frame is received that violates security.

- LockOnNext – The next frame received by each port on the interface connector is examined to learn its source address. After the source address of a frame is learned on a port, it is now locked on that address and only those frames received with that same source address are allowed on that port. All frames received that do not have that same source address will cause the device to execute the actions selected in the Action On Intruder field.

Action On Intruder (Toggle)

Used to select the actions taken for the selected security state. There are two fields in which to select the actions. Both toggle to activate or deactivate the action.

- DisablePort/NoDisablePort – DisablePort causes the switch to turn off the port that had a security violation. With NoDisable set, the port is not turned off.
- SendTrap/NoTrap – SendTrap causes the switch to send an SNMP trap when a port detects a security violation. With NoTrap set, no SNMP trap is sent.

2.2.1 Setting the Repeater Level Security

To set the security on all repeater ports of each connector, proceed as follows:

1. Use the arrow keys to highlight the **Security State** field for the interface connector.
2. Use the SPACE bar to step to the appropriate security level (NonSecure, LockedOnAddr, or LockOnNext).
3. If the security level chosen causes the **DisablePort** and **SendTrap** fields to display under Action On Intruder, use the arrow keys to highlight the **DisablePort** field. If the security level chosen does not cause the fields to display under Action On Intruder, proceed to step 7.

4. To change the **DisablePort** setting to **NoDisablePort**, press the SPACE bar to toggle the setting.
5. Use the arrow keys to highlight the **SendTrap** field.
6. To change the **SendTrap** setting to **NoTrap**, press the SPACE bar to toggle the setting.
7. To change the security on all interface ports on more than one connector, repeat step 1 through step 6 for each connector. Then proceed to step 8 to save all settings at once.
8. Use the arrow keys to highlight the **SAVE** command.
9. Press ENTER. The message “SAVED OK” displays and all ports of the connector are set to the selected operating mode.

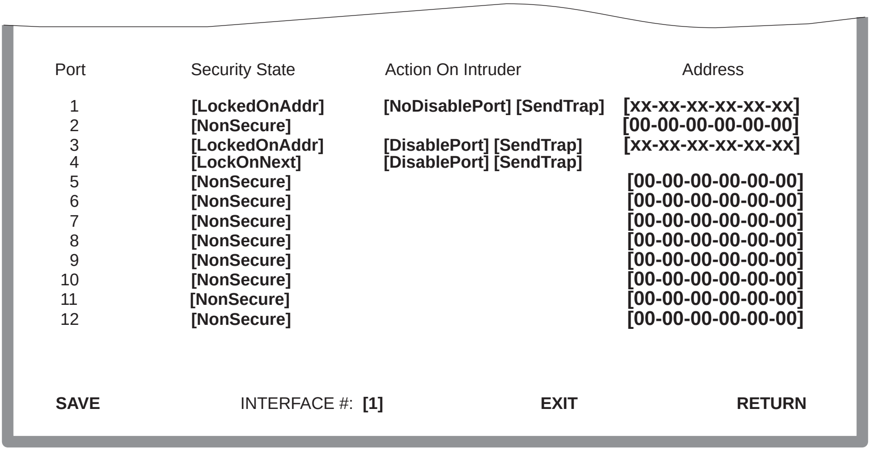
NOTE

If LockedOnAddr is chosen as the Security State, the address of the repeater ports must be configured in the Port Level Security Configuration screen. Refer to Section 2.3.

2.3 PORT LEVEL SECURITY CONFIGURATION SCREEN

The Port Level Security Configuration screen, Figure 2-3, functions similarly to the Repeater Level Security Configuration screen, except that it is used to set the security of each port of a selected connector.

To access the Port Level Security Configuration screen, use the arrow keys to highlight the **PORT LEVEL SECURITY CONFIGURATION** menu item on the Repeater Configuration Menu screen and press ENTER. The Port Level Security Configuration screen displays.



```
Port     Security State     Action On Intruder            Address

  1      [LockedOnAddr]     [NoDisablePort] [SendTrap]    [xx-xx-xx-xx-xx-xx]
  2      [NonSecure]                                      [00-00-00-00-00-00]
  3      [LockedOnAddr]     [DisablePort] [SendTrap]      [xx-xx-xx-xx-xx-xx]
  4      [LockOnNext]       [DisablePort] [SendTrap]
  5      [NonSecure]                                      [00-00-00-00-00-00]
  6      [NonSecure]                                      [00-00-00-00-00-00]
  7      [NonSecure]                                      [00-00-00-00-00-00]
  8      [NonSecure]                                      [00-00-00-00-00-00]
  9      [NonSecure]                                      [00-00-00-00-00-00]
 10      [NonSecure]                                      [00-00-00-00-00-00]
 11      [NonSecure]                                      [00-00-00-00-00-00]
 12      [NonSecure]                                      [00-00-00-00-00-00]


SAVE          INTERFACE #:  [1]          EXIT          RETURN
```

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Figure 2-3 Port Level Security Configuration Screen

The following section defines the fields on the Port Level Security Configuration screen.

Port (Read-only)

Lists the repeater ports on the ENET interface connector (ENET 1 through 4) selected in the INTERFACE # field. Refer to Table 2-1 for the ENET/repeater port relationship on the device.

Table 2-1 ENET/Repeater Port Relationship

ENET 1 = Repeater ports 1 – 12	ENET 3 = Repeater ports 25 – 36
ENET 2 = Repeater ports 13 – 24	ENET 4 = Repeater ports 37 – 48

Security State (Selectable)

Used to select the security state of each repeater port on the connector for frames received. The states are as follows:

- NonSecure – Allows the ports on the connector to receive all frames. The source address of received frames is not examined and the frames are processed in a non secure state.

  The last source address detected is displayed in the address column. This provides a quick and easy way to see what address belongs to what port.

- LockOnNext – The next frame received by each port is examined to learn its source address. After the source address of a frame is learned on a port, it is now locked on that address and only those frames received with that same source address are allowed on that port. All frames received that do not have that same source address will cause the device to execute the actions selected in the Action On Intruder field.

- LockedOnAddr – The port locks down on the address that is currently configured in the Port Level Security Configuration screen (if one is entered) or on the source address of the currently received frame. If an address was not configured or received, the device defaults to the locked on address of “00-00-00-00-00-00” as indicated by “XX-XX-XX-XX-XX-XX” in the address field shown in Figure 2-3. When a port is locked on an address and the frame received violates the set security, the actions selected in the Action On Intruder field are executed.

Action On Intruder (Toggle)

Used to select the actions taken for the selected security state. There are two fields to select the actions. Both toggle to activate or deactivate the action.

- DisablePort/NoDisablePort– DisablePort causes the switch to turn off the port that had a security violation. With NoDisablePort set, the port is not turned off.

- SendTrap/NoTrap – SendTrap causes the switch to send an SNMP trap when a port detects a security violation. With NoTrap set, no SNMP trap is sent.

Address (Modifiable)

Used to enter the source MAC address for the LockedOnAddr security state setting. Once a secure address is defined on a port, only those frames received with that same source address are allowed on that port. Any other frame detected with a different address is considered as an intruder, causing the actions selected in the Action On Intruder field to be executed. When the security state setting is NonSecure, the field displays the source address of the last frame.

INTERFACE # (Selectable)
Used to select the front panel interface connector (ENET 1 to ENET 4) to which the port security settings will be applied.

2.3.1 Setting the Port Level Security

To set the security for each repeater port on a connector, proceed as follows:

1. Use the arrow keys to highlight the **INTERFACE #** field.
2. Use the SPACE bar to step to the appropriate interface connector number (ENET 1 to ENET 4).
3. Press ENTER to display the ports on the chosen interface connector.
4. Use the arrow keys to highlight the **Security State** field for the interface connector.
5. Use the SPACE bar to step to the appropriate security level (NonSecure, LockOnNext, or LockedOnAddr).
6. If the security level chosen causes the **DisablePort** and **SendTrap** fields to display under Action On Intruder, use the arrow keys to highlight the **DisablePort** field. If the security level chosen does not cause the fields to display under Action On Intruder, proceed to step 12.
7. To change the **DisablePort** setting to **NoDisablePort**, press the SPACE bar to toggle the setting.
8. Use the arrow keys to highlight the **SendTrap** field.
9. To change the setting to **NoTrap**, press the SPACE bar to toggle the setting.
10. If the security state selected is LockedOnAddr, use the arrow keys to highlight the **Address** field for the port. Otherwise go to step 12.
11. Enter the MAC address, using the numerical keys. It is not necessary to separate the numbers with dashes when entering the address.
12. To change the security on more than one port, repeat step 4 through step 11 for each port. Then proceed to step 13 to save all settings at once.

13. Use the arrow keys to highlight the **SAVE** command.

14. Press ENTER. The message “SAVED OK” displays and all ports of the connector are set to the selected operating mode.

15. To change the security on a different interface connector, repeat step 1 through step 14 as needed.

CHAPTER 3

LM SECURITY SCREENS FOR 2H23-50R/2H33-37R DEVICES

The information in this chapter replaces the information about the Repeater Configuration Menu and Repeater Port Configuration screens provided in the *2H23-50R/2H33-37R SmartSwitch 2100 User's Guide*.

3.1 REPEATER CONFIGURATION MENU SCREEN

The Repeater Configuration Menu screen, Figure 3-1, is used to access the Repeater Port Configuration, Module Level Security Configuration, or Port Level Security Configuration screen. To access the Repeater Configuration Menu screen from the Port Configuration Menu screen, select the **REPEATER CONFIGURATION MENU** item and press ENTER. The Repeater Configuration Menu screen displays.

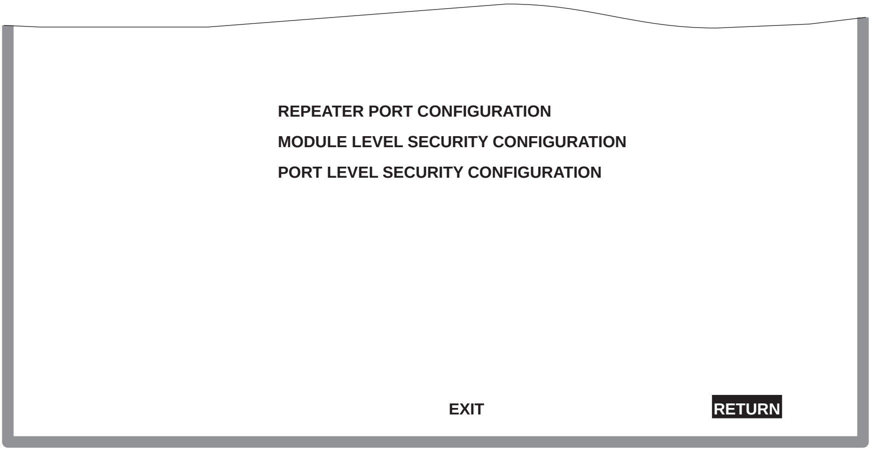

REPEATER PORT CONFIGURATION
MODULE LEVEL SECURITY CONFIGURATION
PORT LEVEL SECURITY CONFIGURATION
EXIT
RETURN
2745_104w

Figure 3-1 Repeater Configuration Menu Screen

The following introduces each screen that is accessible from the Repeater Configuration Menu.

REPEATER PORT CONFIGURATION

Used to monitor the link status and current operating mode of each port on the 10-Mbps or 100-Mbps network of a front panel connector, and also turn each port on or off. For details, refer to Section 3.2.

MODULE LEVEL SECURITY CONFIGURATION

Used to set the state of security for each port of a connector, simultaneously. All ports on a connector can be set to receive all frames (NonSecure state), lock on the source address of the next frame received (LockOn Next), or lock on the address of the last frame received (Locked On Addr). For details, refer to Section 3.3.

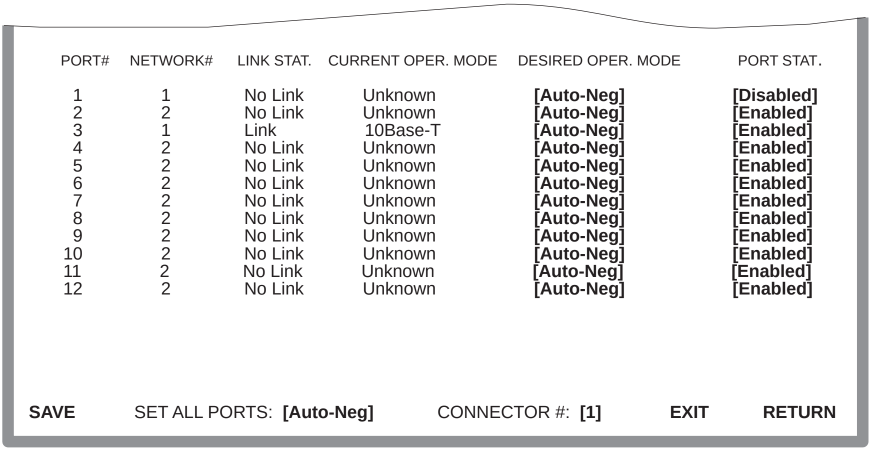
PORT LEVEL SECURITY CONFIGURATION

Used to set the security for all ports of a connector. For details, refer to Section 3.4.

3.2 REPEATER PORT CONFIGURATION SCREEN

The Repeater Port Configuration screen, Figure 3-2, is used to monitor the link status and current operating mode of each repeater port on a 10-Mbps or 100-Mbps network of a front panel connector. The screen is also used to change the operating mode, and turn each repeater port on (enable) or off (disable).

To access the Repeater Port Configuration screen, use the arrow keys to highlight the **REPEATER PORT CONFIGURATION** menu item from the Repeater Configuration Menu screen and press ENTER. The Repeater Port Configuration screen displays.



```
   PORT#    NETWORK#    LINK STAT.  CURRENT OPER. MODE   DESIRED OPER. MODE        PORT STAT.

     1          1          No Link       Unknown              [Auto-Neg]           [Disabled]
     2          2          No Link       Unknown              [Auto-Neg]           [Enabled]
     3          1          Link           10Base-T            [Auto-Neg]           [Enabled]
     4          2          No Link       Unknown              [Auto-Neg]           [Enabled]
     5          2          No Link       Unknown              [Auto-Neg]           [Enabled]
     6          2          No Link       Unknown              [Auto-Neg]           [Enabled]
     7          2          No Link       Unknown              [Auto-Neg]           [Enabled]
     8          2          No Link       Unknown              [Auto-Neg]           [Enabled]
     9          2          No Link       Unknown              [Auto-Neg]           [Enabled]
    10          2          No Link       Unknown              [Auto-Neg]           [Enabled]
    11          2          No Link       Unknown              [Auto-Neg]           [Enabled]
    12          2          No Link       Unknown              [Auto-Neg]           [Enabled]



 SAVE      SET ALL PORTS:  [Auto-Neg]      CONNECTOR #:  [1]       EXIT      RETURN
```

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Figure 3-2 Repeater Port Configuration Screen

The following are definitions for each field of the Repeater Port Configuration screen:

PORT # (Read-only)
Indicates the repeater port on the connector selected in the CONNECTOR field. Refer to Table 3-1 for the connector (CONN) /repeater port relationship on the device.

Table 3-1 CONN/Repeater Port Relationship

2H23-50R	2H33-37R
CONN 1 = Repeater ports 1 – 12	CONN 1 = Repeater ports 1 – 12
CONN 2 = Repeater ports 13 – 24	CONN 2 = Repeater ports 13 – 24
CONN 3 = Repeater ports 25 – 36	CONN 3 = Repeater ports 25 – 36
CONN 4 = Repeater ports 37 – 48	

NETWORK # (Read-only)

Indicates the network on the connector selected in the CONNECTOR field. Table 3-2 shows the association between the connector (CONN) and Networks on the device.

Table 3-2 CONN/Network Organization

2H23-50R	2H33-37R
CONN 1 = Network 1, 10 Mbps Network 2, 100 Mbps	CONN 1 = Network 1, 10 Mbps Network 2, 100 Mbps
CONN 2 = Network 3, 10 Mbps Network 4, 100 Mbps	CONN 2 = Network 3, 10 Mbps Network 4, 100 Mbps
CONN 3 = Network 5, 10 Mbps Network 6, 100 Mbps	CONN 3 = Network 5, 10 Mbps Network 6, 100 Mbps
CONN 4 = Network 7, 10 Mbps Network 8, 100 Mbps	HSIM = 7

LINK STAT. (Read-only)

Displays the Link status (Link or No Link) of the port.

CURRENT OPER. MODE (Read-only)

Displays the current operating mode of the port.

DESIRED OPER. MODE (Selectable)

Steps through the following operating mode options: Auto-Neg (Auto Negotiation), 10Base-T, and 100Base-TX.

- When Auto-Neg. is selected, the port automatically negotiates with the device to which it is attached to determine its Operating Mode (10 Mbps or 100 Mbps).
- When 10Base-T is selected, the port is forced to operate in standard Ethernet mode (10 Mbps) only.
- When 100Base-TX is selected, the port is forced to operate in Fast Ethernet mode (100 Mbps) only.

To set the port operating mode, refer to Section 3.2.1.

PORT STAT. (Toggle)
Used to enable (turn on) or disable (turn off) the port. To enable or disable the port, refer to Section 3.2.2.

SET ALL PORTS (Selectable)
Used to select operating mode for all the ports on the connector simultaneously. This field steps through the following selections: Auto-Neg., 10Base T, and 100Base-TX. To set all the ports to the same operating mode, refer to Section 3.2.3.

CONNECTOR # (Selectable)
Selects the front panel connector to which the settings will be applied.

3.2.1 Setting the Port Operating Mode

To set the operating mode for one or more repeater ports, proceed as follows:

1. Use the arrow keys to highlight the **CONNECTOR #** field.
2. Use the SPACE bar to step to the appropriate connector number.
3. Press ENTER to display the repeater port settings on that connector.
4. Use the arrow keys to highlight the **DESIRED OPER. MODE** field of the repeater port being configured.
5. Use the SPACE bar to step to the appropriate Operating Mode (Auto-Neg, 10Base-T, or 100Base-TX).
6. If setting the operating mode on other repeater ports, repeat steps 4 and 5 for each one and then proceed to step 7.
7. Use the arrow keys to highlight the **SAVE** command.
8. Press ENTER. The message “SAVED OK” displays and all operating mode settings are saved.

3.2.2 Enabling /Disabling Repeater Ports

To enable or disable one or more repeater ports, proceed as follows:

1. Use the arrow keys to highlight the **CONNECTOR #** field.
2. Use the SPACE bar to step to the number of the connector containing the repeater port(s) to be enabled or disabled.

3. Press ENTER to display the repeater port settings on that connector.
4. Use the arrow keys to highlight the **PORT STAT.** field of the repeater port being enabled or disabled.
5. Use the SPACE bar to toggle to the appropriate setting (Enable or Disable).
6. If setting more than one repeater port, repeat steps 4 and 5 for each one and then proceed to step 7.
7. Use the arrow keys to highlight the **SAVE** command.
8. Press ENTER. The message "SAVED OK" displays and all settings are saved.

3.2.3 Setting Operating Mode On All Repeater Ports

The repeater ports on a connector can be set to the same operating mode simultaneously using the SET ALL PORTS field, as follows:

1. Use the arrow keys to highlight the **CONNECTOR #** field.
2. Use the SPACE bar to step to the appropriate connector number.
3. Press ENTER to display the repeater port settings on that connector.
4. Use the arrow keys to highlight the **SET ALL PORTS** field.
5. Use the SPACE bar to step to the appropriate Operating Mode (Auto-Neg, 10Base-T, or 100Base-TX).
6. Press ENTER.
7. Enable or disable each repeater port as needed. Refer to Section 3.2.2 for instructions.
8. Use the arrow keys to highlight the **SAVE** command.
9. Press ENTER. The message "SAVED OK" displays and all repeater ports of the connector are set to the selected operating mode.

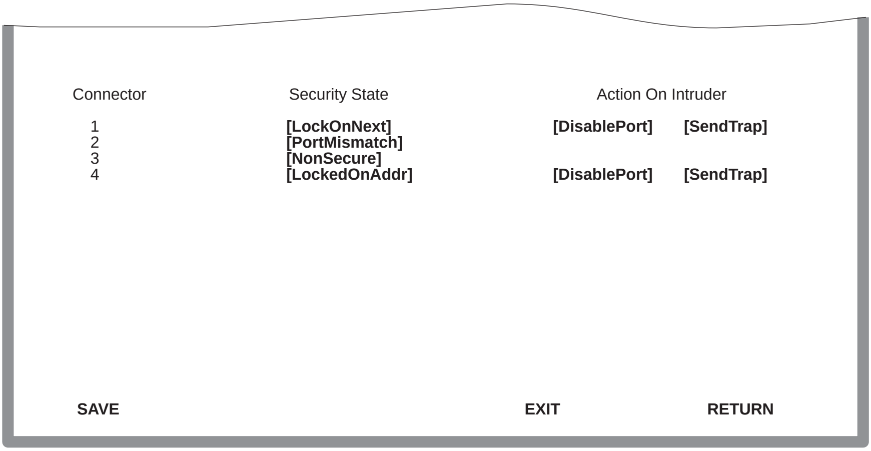
NOTE

If LockedOnAddr is chosen as the Security State, the individual port must be configured in the Port Level Security Configuration screen. Sections 3.4 provides instructions for configuring individual ports.

3.3 MODULE LEVEL SECURITY CONFIGURATION

The Module Level Security Configuration screen, Figure 3-3, is used to set the state of security according to connector. All repeater ports on a connector can be set to receive all frames (NonSecure state), lock on the source address of the next frame received (LockOnNext) or the source address of the last frame received (LockedOnAddr). When either of the last two options are set, the switch can be set to enable or disable the reception of frames and send or not send traps when an intruder is detected.

To access the Module Level Security Configuration screen, use the arrow keys to highlight the **MODULE LEVEL SECURITY CONFIGURATION** menu item on the Repeater Configuration Menu screen and press ENTER. The Module Level Security Configuration screen displays.



Connector	Security State	Action On Intruder	
1	**[LockOnNext]**	**[DisablePort]**	**[SendTrap]**
2	**[PortMismatch]**		
3	**[NonSecure]**		
4	**[LockedOnAddr]**	**[DisablePort]**	**[SendTrap]**

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Figure 3-3 Module Level Security Configuration Screen

The following section defines the fields on the Module Level Security Configuration screen.

Connector (Read-Only)

Indicates the connector. Refer to Table 3-3 for the connector (CONN)/repeater port relationship on the device.

Table 3-3 CONN/Repeater Port Relationship

2H23-50R	2H33-37R
CONN 1 = Repeater ports 1 – 12	CONN 1 = Repeater ports 1 – 12
CONN 2 = Repeater ports 13 – 24	CONN 2 = Repeater ports 13 – 24
CONN 3 = Repeater ports 25 – 36	CONN 3 = Repeater ports 25 – 36
CONN 4 = Repeater ports 37 – 48	

Security State (Selectable)

Used to set all ports on an interface connector to the same security state. PortMismatch is a Read-Only field that indicates not all ports on the interface connector are set to the same state. The selectable states are as follows:

- NonSecure – Allows the ports on the connector to receive all frames. The source address of received frames is not examined and the frames are processed in a non secure state.
- LockOnNext – The next frame received by each port is examined to learn its source address. After the source address of a frame is learned on a port, it is now locked on that address and only those frames received with that same source address are allowed on that port. All frames received that do not have that same source address will cause the device to execute the actions selected in the Action On Intruder field.

- LockedOnAddr – The Security State of all ports on the specified connector are set to LockedOnAddr. This setting is for convenience, so that all ports on an interface connector can be set to LockedOnAddr at one time. Until the address is set at the repeater port level, the port will default to the locked on address of “00-00-00-00-00-00” as indicated by “XX-XX-XX-XX-XX-XX” in the address field shown in Figure 3-4. If an address is configured or received, the port locks down on the address that is currently configured in the Port Level Security Configuration screen (if one is entered) or on the source address of the currently received frame. If the port locks on address and a frame is received that violates security, the actions selected in the Action On Intruder field are executed.

Action On Intruder (Toggle)
Used to select the actions taken for the selected security state. There are two fields to select the actions. Both toggle to activate or deactivate the action.

- DisablePort/NoDisable – DisablePort causes the switch to turn off the port that had a security violation. With NoDisable set, the port is not turned off.

- SendTrap/NoTrap – SendTrap causes the switch to send an SNMP trap when a port detects a security violation. With NoTrap set, no SNMP trap is sent.

3.3.1 Setting the Module Level Security

To set the module security simultaneously for all ports on a connector, proceed as follows:

1. Use the arrow keys to highlight the **Security State** field for the connector.

2. Use the SPACE bar to step to the appropriate security level.

3. If the security level chosen causes the **DisablePort** and **SendTrap** fields to display under Action On Intruder, use the arrow keys to highlight the **DisablePort** field. If the security level chosen does not cause the fields to display under Action On Intruder, proceed to step 7.

4. To change the **DisablePort** setting to **NoDisable**, press the SPACE bar to toggle the setting.

5. Use the arrow keys to highlight the **SendTrap** field.
6. To change the **SendTrap** setting to **NoTrap**, press the SPACE bar to toggle the setting.
7. To change the security on more than one connector, repeat steps 1 through 6 for each connector. Then proceed to step 8 to save all settings at once.
8. Use the arrow keys to highlight the **SAVE** command.
9. Press ENTER. The message “SAVED OK” displays and all ports of the connector are set to the selected operating mode.

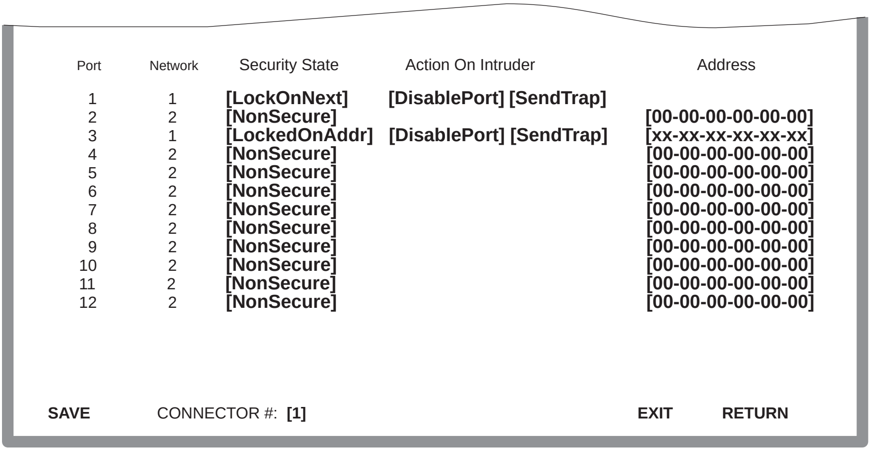
NOTE

If LockedOnAddr is chosen as the Security State, the address of the repeater ports must be configured in the Port Level Security Configuration screen. Refer to Section 3.4.

3.4 PORT LEVEL SECURITY CONFIGURATION SCREEN

The Port Level Security Configuration screen, Figure 3-4, is used to set the security of each port of a selected connector.

To access the Port Level Security Configuration screen, use the arrow keys to highlight the **PORT LEVEL SECURITY CONFIGURATION** menu item on the Repeater Configuration Menu screen and press ENTER. The Port Level Security Configuration screen displays.



```
   Port     Network     Security State       Action On Intruder                Address

    1          1       [LockOnNext]      [DisablePort] [SendTrap]
    2          2       [NonSecure]                                      [00-00-00-00-00-00]
    3          1       [LockedOnAddr]    [DisablePort] [SendTrap]       [xx-xx-xx-xx-xx-xx]
    4          2       [NonSecure]                                      [00-00-00-00-00-00]
    5          2       [NonSecure]                                      [00-00-00-00-00-00]
    6          2       [NonSecure]                                      [00-00-00-00-00-00]
    7          2       [NonSecure]                                      [00-00-00-00-00-00]
    8          2       [NonSecure]                                      [00-00-00-00-00-00]
    9          2       [NonSecure]                                      [00-00-00-00-00-00]
   10          2       [NonSecure]                                      [00-00-00-00-00-00]
   11          2       [NonSecure]                                      [00-00-00-00-00-00]
   12          2       [NonSecure]                                      [00-00-00-00-00-00]


 SAVE          CONNECTOR #:  [1]                                   EXIT        RETURN
```

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Figure 3-4 Port Level Security Configuration Screen

NOTE The screen will not refresh automatically. To check if the states have changed, such as from LockOnNext to LockedOnAddr, the screen must be exited (Return may be used) and re-entered to see the changed state.

The following section defines the fields on the Port Level Security Configuration screen.

Port (Read-only)

Indicates the repeater port on the connector selected in the CONNECTOR # field. Refer to Table 3-4 for the connector (CONN)/repeater port relationship on the device.

Table 3-4 CONN/Repeater Port Relationship

2H23-50R	2H33-37R
CONN 1 = Repeater ports 1 – 12	CONN 1 = Repeater ports 1 – 12
CONN 2 = Repeater ports 13 – 24	CONN 2 = Repeater ports 13 – 24
CONN 3 = Repeater ports 25 – 36	CONN 3 = Repeater ports 25 – 36
CONN 4 = Repeater ports 37 – 48	

Network (Read-only)

Indicates the network to which the port is currently attached. Table 3-5 shows the association between the connector (CONN) and Network on the device.

Table 3-5 CONN/Network Organization

2H23-50R	2H33-37R
CONN 1 = Network 1, 10 Mbps Network 2, 100 Mbps	CONN 1 = Network 1, 10 Mbps Network 2, 100 Mbps
CONN 2 = Network 3, 10 Mbps Network 4, 100 Mbps	CONN 2 = Network 3, 10 Mbps Network 4, 100 Mbps
CONN 3 = Network 5, 10 Mbps Network 6, 100 Mbps	CONN 3 = Network 5, 10 Mbps Network 6, 100 Mbps
CONN 4 = Network 7, 10 Mbps Network 8, 100 Mbps	HSIM = Port 7

Security State (Selectable)

Used to select the state of security for frames received by a specific port on the connector. The states are as follows:

- NonSecure – Allows the ports on the connector to receive all frames. The source address of received frames is not examined and the frames are processed in a non secure state.
- LockOnNext – The next frame received by each port is examined to learn its source address. After the source address of a frame is learned on a port, it is now locked on that address and only those frames received with that same source address are allowed on that port. All frames received that do not have that same source address will cause the device to execute the actions selected in the Action On Intruder field.
- LockedOnAddr – The device locks down on the address that is currently configured in the Port Level Security Configuration screen (if one is entered) or on the source address of the currently received frame. If an address was not configured or received, the device defaults to the locked on address of "00-00-00-00-00-00" as indicated by "XX-XX-XX-XX-XX-XX" in the address field shown in Figure 3-4.

When a port is locked on an address, the device executes the actions selected in the Action On Intruder field when a frame is received that violates security.

Action On Intruder (Toggle)

Used to select the actions taken for the selected security state. There are two fields to select the actions. Both toggle to activate or deactivate the action.

- DisablePort/NoDisable – DisablePort causes the switch to turn off the port that had a security violation. With NoDisable set, the port is not turned off.
- SendTrap/NoTrap – SendTrap causes the switch to send an SNMP trap when a port detects a security violation. With NoTrap set, no SNMP trap is sent.

Address (Modifiable)

Used to enter the source MAC address for the LockedOnAddr security state setting. Once a secure address is defined on a port, only those frames received with that same source address are allowed on that port. Any other frame detected with a different address is considered as an intruder, causing the actions selected in the Action On Intruder field to be executed. When the security state setting is NonSecure, the field displays the source address of the last frame.

The Address column will display the MAC address used for the security states, NonSecure or LockedOnAddr. This could be the last address seen (NonSecure) or the address manually entered for the LockedOnAddr security state.

CONNECTOR # (Selectable)

This command field selects the front panel connector to which the port security settings will be applied.

3.4.1 Setting the Port Level Security

To set the security for each repeater port on a connector, proceed as follows:

1. Use the arrow keys to highlight the **CONNECTOR #** field.

2. Use the SPACE bar to step to the appropriate connector (CONN) number.

3. Press ENTER to display the 12 repeater ports of the selected connector.

4. Use the arrow keys to highlight the **Security State** field for the desired repeater port.

5. Use the SPACE bar to step to the appropriate security level (NonSecure, LockOnNext, or LockedOnAddr).

6. If the security level chosen causes the **DisablePort** and **SendTrap** fields to display under Action On Intruder, use the arrow keys to highlight the **DisablePort** field.

   If the security level chosen does not cause the fields to display under Action On Intruder, proceed to step 10.

7. To change the **DisablePort** setting to **NoDisable**, press the SPACE bar to toggle the setting.

8. Use the arrow keys to highlight the **SendTrap** field.

9. To change the setting to **NoTrap**, press the SPACE bar to toggle the setting.

10. If the security state selected is LockedOnAddr, use the arrow keys to highlight the **Address** field for the repeater port. Otherwise go to step 12.

11. Enter the MAC address to lock on, using the numerical keys. When entering the address, it is not necessary to include dashes in the number.

12. To change the security on more than one repeater port, repeat steps 4 through 11 for each port.

13. After configuring the repeater ports, use the arrow keys to highlight the **SAVE** command.

14. Press ENTER. The message “SAVED OK” displays and all configured settings for all repeater ports of the connector are saved.

15. If the ports on another connector need to be configured, repeat steps 1 through 14.

CHAPTER 4

GENERIC ATTRIBUTE REGISTRATION PROTOCOL (GARP)

This appendix provides the following information:

- Describes the switch operation when its ports are configured to operate under the Generic Attribute Registration Protocol (GARP) applications – GARP VLAN Registration Protocol (GVRP) and/or GARP Multicast Registration Protocol (GMRP).
- Describes the GARP Configuration screen and how to use it to enable/disable GVRP and GMRP on the switch and set each port to operate as a GVRP- and/or GMRP-aware port.
- Describes the GMRP Configuration screen and how to use it to select individual ports, or all of the ports, and apply one of four modes of operation according to, or regardless of, the multicast address registration.

4.1 GARP SWITCH OPERATION

Some or all ports on the switch may be activated to operate under the GARP applications, GVRP and/or GMRP. A description of how GVRP and GMRP handle frames under GARP is described in Section 4.1.1 and Section 4.2.

4.1.1 GARP VLAN Registration Protocol (GVRP)

The process of the forwarding decision and tagging frames is the same as for 802.1Q as described in the Cabletron Systems *802.1Q VLAN User's Guide*. However, the GVRP protocol frames will not have a tag even when transmitted out a 1Q Trunk Port.

The purpose of GVRP is to dynamically create VLANs across a switched network. When a VLAN is declared, the information is transmitted out GVRP configured ports on the switch in a GARP formatted frame using the GVRP multicast MAC address (01-80-C2-00-00-21). A switch that receives this frame, examines the frame, and extracts the VLAN IDs. GVRP then creates the VLANs and adds the receiving port to its tagged member list for the extracted VLAN ID(s). The information is then transmitted out the other GVRP configured ports of the switch. Figure 4-1 shows an example of how VLAN blue from end station A would be propagated across a switch network.

In Figure 4-1, Switch 4, port 1 is registered as being a member of VLAN Blue and then declares this fact out all its ports (2 and 3) to Switch 1 and Switch 2. These two switches register this in the Port VLAN Lists of the ports (Switch 1, port 1 and Switch 2 Port 1) that received the frames with the information. Switch 2, which is connected to Switch 3 and Switch 5 declares the same information to those two switches and the Port VLAN List of each port is updated with the new information, accordingly.

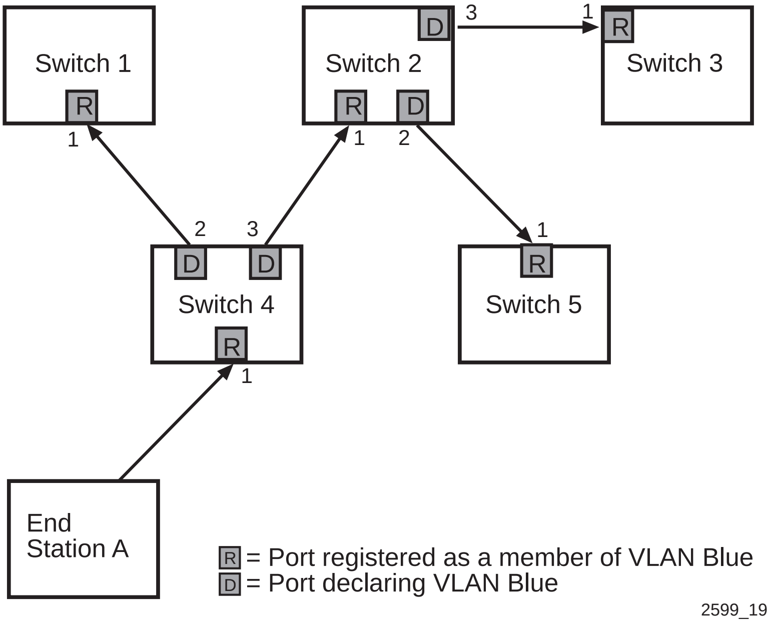


Figure 4-1 Example of VLAN Propagation via GVRP

Configuring a VLAN on an 802.1Q switch creates a static GVRP entry. The entry will always remain registered and will not time out. However, dynamic entries will time-out and their registrations are removed from the member list if the end station A is removed. This ensures that if switches are disconnected, or if end stations are removed, the registered information remains accurate.

The end result is that the Port VLAN List of a port is updated with information about VLANs that reside off that port, even if the actual station on the VLAN is several hops away.

4.2 GARP MULTICAST REGISTRATION PROTOCOL (GMRP)

GMRP functions in a similar fashion as GVRP, except that GMRP registers multicast addresses on ports. The GMRP uses the multicast address (01-80-C2-00-00-20) for controlling the flooding of multicast frames. End stations register with the port that they are connected to and tell the port which multicast frames they will receive. This is accomplished under control of GMRP, which is propagated in VLAN context.

More Detail on Received GMRP Frames

The device is capable of supporting multiple filter databases and each VLAN is assigned to a database. When GMRP frames are received, they may contain a tag or be untagged.

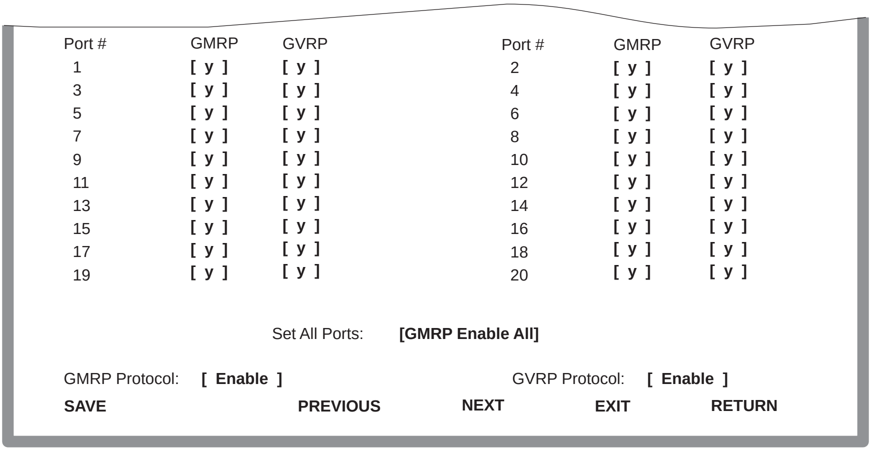
If the GMRP frame is untagged, the multicast addresses listed in the GMRP frame are added to the Port VLAN List of the receiving port. (For more information about the Port VLAN List, refer to the Cabletron Systems *802.1Q VLAN Users Guide*.)

If the GMRP frame is tagged, then the VLAN ID in the tag is used to find the filter database to which the multicast address is registered, and then the frame is transmitted out the appropriate ports accordingly.

4.3 GARP OPERATION STATUS SCREEN

The GARP Operation Status screen, Figure 4-2, is used to enable ports on the switch as GMRP- and GVRP-aware ports. The ports may be enabled one by one or all at the same time for GMRP and GVRP.

To access the GARP Operation Status screen, use the arrow keys to highlight the **GARP OPERATION STATUS** menu item on the 802.1 Configuration Menu screen and press ENTER. The GARP Operation Status screen displays.



```
Port #          GMRP      GVRP                 Port #       GMRP      GVRP
  1             [ y ]     [ y ]                  2          [ y ]     [ y ]
  3             [ y ]     [ y ]                  4          [ y ]     [ y ]
  5             [ y ]     [ y ]                  6          [ y ]     [ y ]
  7             [ y ]     [ y ]                  8          [ y ]     [ y ]
  9             [ y ]     [ y ]                 10          [ y ]     [ y ]
 11             [ y ]     [ y ]                 12          [ y ]     [ y ]
 13             [ y ]     [ y ]                 14          [ y ]     [ y ]
 15             [ y ]     [ y ]                 16          [ y ]     [ y ]
 17             [ y ]     [ y ]                 18          [ y ]     [ y ]
 19             [ y ]     [ y ]                 20          [ y ]     [ y ]


                    Set All Ports:     [GMRP Enable All]

GMRP Protocol:   [ Enable ]                    GVRP Protocol:   [ Enable ]
SAVE                      PREVIOUS        NEXT          EXIT         RETURN
```

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Figure 4-2 GARP Operation Status Screen

The following describes the screen fields.

Port # (Read-Only)

Displays the number of the front panel interface.

GMRP (Toggle)

Sets the port to operate as a GMRP-aware port. The setting is only valid if the GMRP Protocol field near the bottom of the screen is set to Enable. The GMRP field setting toggles between Y (yes) and N (no).

The default is “Y”.

To set the port, refer to Section 4.3.1.

GVRP (Toggle)

Sets the port to operate as a GVRP-aware port. The setting is only valid if the GVRP Protocol field near the bottom of the screen is set to Enable. The GMRP field setting toggles between Y (yes) and N (no). The default is “Y”.

To set the port, refer to Section 4.3.1.

Set All Ports (Selectable)

Sets all ports to the same setting by selecting one of the following:

- **GMRP Enable All** – Sets all ports as GMRP-aware ports. All ports are set to Y under GMRP.
- **GMRP Disable All** – Sets all ports as not GMRP-aware ports. All ports are set to N under GMRP.
- **GVRP Enable All** – Sets all ports as GVRP-aware ports. All ports are set to Y under GVRP.
- **GVRP Disable All** – Sets all ports as not GVRP-aware ports. All ports are set to N under GVRP.
- **Enable All** – Sets all ports to Y for both GMRP and GVRP.
- **Disable All** – Sets all ports to N for both GMRP and GVRP.

To set all ports, refer to Section 4.3.1.

GMRP Protocol (Toggle)

Enables or disables the GMRP Protocol on the switch.

When set to Enable, all port settings are valid for GMRP, enabling those ports to send/receive frames to other GMRP-aware switches. Disable makes the port settings invalid.

The default setting is “Disable”.

To enable or disable the protocol, refer to Section 4.3.2.

GVRP Protocol (Toggle)
Enables or disables the GVRP Protocol on the switch.

When set to Enable, all port settings are valid for GVRP enabling those ports to send/receive frames to other GVRP-aware switches. Disable makes the port settings invalid.

The default setting is “Disable”.

To enable or disable the protocol, refer to Section 4.3.2.

4.3.1 Setting a Port to Operate in GMRP or GVRP

To set a port to be a GMRP or GVRP aware port. Proceed as follows:

1. Use the arrow keys to highlight the **GMRP** or **GVRP** field of the port.
2. Press the SPACE bar to choose **Y** (yes).
3. Repeat steps 1 and 2 to set GMRP and GVRP of ports as necessary.
4. Use the arrow keys to highlight the **SAVE** command.
5. Press ENTER. The message “SAVED OK” displays and all settings are saved.

4.3.2 Setting All Ports on the Switch

All ports on the switch can be set at one time to one mode of operation using the Set All Ports field.

To select the mode of operation using the Set All Ports field, proceed as follows:

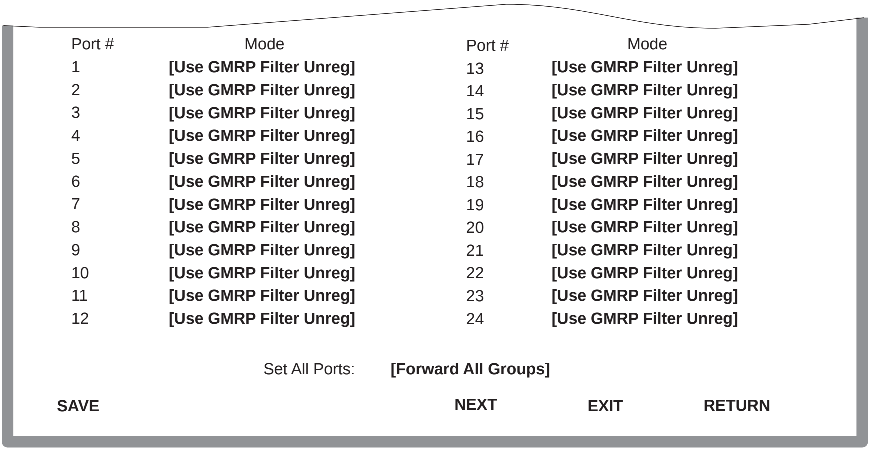
1. Use the arrow keys to highlight the **Set All Ports** field
2. Press the SPACE bar to select one of the following:
   - GMRP Enable All
   - GMRP Disable All
   - GVRP Enable All
   - GVRP Disable All
   - Enable All
   - Disable All

3. Press ENTER.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
5. Press ENTER. The message “SAVED OK” displays.

4.4 GMRP CONFIGURATION SCREEN

The GMRP Configuration screen, Figure 4-3, is used to set the GMRP operation mode of each port.

To access the GMRP Configuration screen, use the arrow keys to highlight the **GMRP GROUP REGISTRATIONS** menu item on the 802.1 Configuration Menu screen and press ENTER. The GMRP Configuration screen displays.



```
   Port #            Mode                        Port #            Mode
   1          [Use GMRP Filter Unreg]            13         [Use GMRP Filter Unreg]
   2          [Use GMRP Filter Unreg]            14         [Use GMRP Filter Unreg]
   3          [Use GMRP Filter Unreg]            15         [Use GMRP Filter Unreg]
   4          [Use GMRP Filter Unreg]            16         [Use GMRP Filter Unreg]
   5          [Use GMRP Filter Unreg]            17         [Use GMRP Filter Unreg]
   6          [Use GMRP Filter Unreg]            18         [Use GMRP Filter Unreg]
   7          [Use GMRP Filter Unreg]            19         [Use GMRP Filter Unreg]
   8          [Use GMRP Filter Unreg]            20         [Use GMRP Filter Unreg]
   9          [Use GMRP Filter Unreg]            21         [Use GMRP Filter Unreg]
   10         [Use GMRP Filter Unreg]            22         [Use GMRP Filter Unreg]
   11         [Use GMRP Filter Unreg]            23         [Use GMRP Filter Unreg]
   12         [Use GMRP Filter Unreg]            24         [Use GMRP Filter Unreg]

                        Set All Ports:     [Forward All Groups]

 SAVE                                      NEXT          EXIT          RETURN
```

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Figure 4-3 GMRP Configuration Screen

The following describes the screen fields.

Port # (Read-Only)
Displays the number of the front panel interface.

Mode (Selectable)

Select one of the following four modes of operation:

- **Use GMRP Filter Unreg** – Do not forward multicast addressed frames out this port that have an unregistered multicast address.
- **Forward All Groups** – Regardless of multicast address registration, send all multicast addressed frames out this port.
- **Filter All Groups** – Regardless of multicast address registration, do not send any multicast addressed frames out his port
- **Use GMRP Forward Unreg** – Forward all multicast addressed frames out this port that have an unregistered multicast address.

The default setting for this field is “Use GMRP Filter Unreg”.

For details on selecting a mode, refer to Section 4.4.1.

Set All Ports (Selectable)

This field enables all ports to be set to one mode simultaneously. The selection is the same as shown for the Mode field.

4.4.1 Setting a Mode, Port-by-Port

To set the Mode of operation for a particular port, proceed as follows:

1. Use the arrow keys to highlight the **Mode** field of a particular port.
2. Press the SPACE bar to select one of the following modes of operation:
   - Use GMRP Filter Unreg
   - Forward All Groups
   - Filter All Groups
   - Use GMRP Forward Unreg
3. Repeat steps 1 and 2 as necessary to select the mode for other ports.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
5. Press ENTER. The message “SAVED OK” displays and all modes selected are saved.

4.4.2 Setting a Mode for All Ports

The modes of operation are the same as the ones described in Section 4.4.1, except that all ports are affected. To set all the ports to operate in one mode, proceed as follows:

1. Use the arrow keys to highlight the **Set All Ports** field.
2. Press the SPACE bar to select one of the following modes of operation:
   - Use GMRP Filter Unreg
   - Forward All Groups
   - Filter All Groups
   - Use GMRP Forward Unreg
3. Press ENTER.
4. Use the arrow keys to highlight the **SAVE** command at the bottom of the screen.
5. Press ENTER. The message “SAVED OK” displays and all ports operate to the mode selected.

CHAPTER 5

NETWORK TOOLS

This chapter introduces the “cdp” command and shows how it affects the Network Tools Help screen. The cdp command is an addition to the built-in commands listed in your SmartSwitch user’s guide.

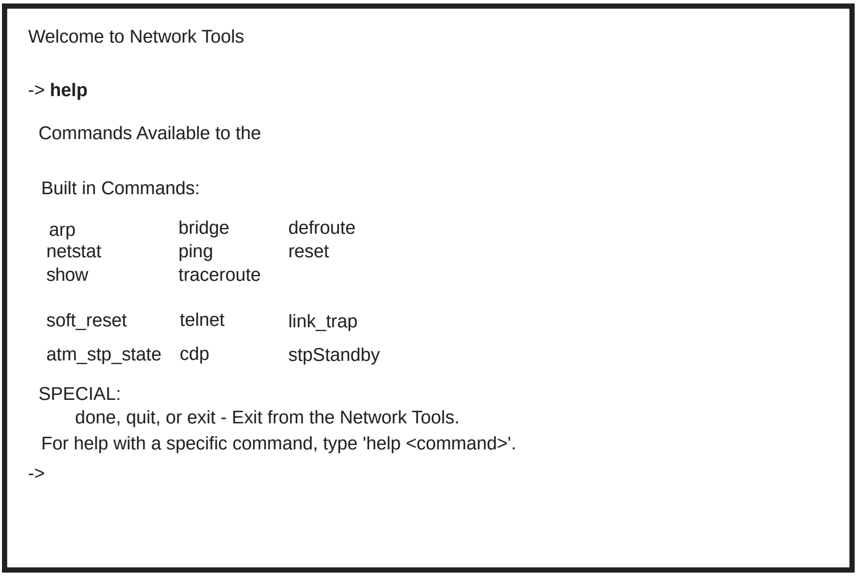
5.1 NETWORK TOOLS

The Network Tools function resides on the platform firmware and allows the user to access and manage network devices. Figure 5-1 shows the updated Network Tools Help screen.

To access the Network Tools screen, access Local Management, then use the arrow keys to highlight the **NETWORK TOOLS** menu item in the Module Menu screen and press ENTER. The Network Tools screen displays.

TIP

Type **help** at the prompt to list all the commands that are available for the device in the current operational mode. A command used incorrectly (wrong syntax) will prompt a display of the correct usage. Use lower case characters when entering commands in Network Tools.



```
Welcome to Network Tools

-> help

  Commands Available to the

   Built in Commands:

    arp             bridge        defroute
   netstat          ping          reset
   show             traceroute

   soft_reset       telnet        link_trap

   atm_stp_state    cdp           stpStandby

  SPECIAL:
        done, quit, or exit - Exit from the Network Tools.
   For help with a specific command, type 'help <command>'.
->
```

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Figure 5-1 Network Tools Help Screen

The Network Tools functions are performed using a series of commands. Entering commands in Network Tools involves typing the command to be executed at the Network Tools prompt, adding any desired or required extensions, and pressing ENTER. For detailed information, see the applicable Local Management User’s Guide.

5.1.1 Built-in Command

The built-in command listed in this section activates a new function on the managed module being accessed through Network Tools.

cdp

Description: Allows management of Cabletron Discovery Protocol (CDP) on this device. This protocol is used by SmartSwitch device to discover other neighboring network devices and establish the topology of the network fabric. This protocol can also be used by the SmartSwitch device to propagate specific information to neighboring network devices.The user may enable, disable, or see the current status of CDP.

Syntax: cdp [enable/disable/status]

Options: None

Example:

```
-> cdp status
CDP is Enabled

-> cdp disable

-> cdp status
CDP is Disabled

-> cdp enable

-> cdp status

CDP is Enabled
```

APPENDIX A
ABOUT IGMP

This appendix provides the following information:

- IGMP Overview
- Supported Features and Functions
- Detecting Multicast Routers

To configure the SmartSwitch device for IGMP operation, refer to Section 1.19 for instructions.

A.1 IGMP OVERVIEW

IGMP is a multicast protocol used by routers. This protocol is supported by Cabletron Systems SmartSwitches when operating in the 802.1Q mode to “snoop” the IGMP frames. The multicast information is gleaned from the IGMP frame and a filter is created to send the stream of data only to those end stations that request to receive it.

IGMP queries are sent periodically from routers. An end station that will receive a multicast stream will send a “query response” back to the router. If the router does not receive any response from the end station, it stops forwarding the multicast streams to that station.

IGMP messages use an IP protocol number of 2. Routers send queries to the all-hosts group of 224.0.0.1. End stations send query responses to the multicast address of the stream they are requesting to receive.

Routers need to be discovered and all multicast packets need to be sent to all routers.

A.2 SUPPORTED FEATURES AND FUNCTIONS

The following lists the features and functions supported when using IGMP:

- Runs only when the switch is operating in the 802.1Q mode.
- Supports multiple multicast and non-multicast routers on the same VLAN.

- Supports stand alone multicast servers only if a router is present on the network.
- Multicast forwarding rate is dependent on the number of ports to which the multicast stream is forwarded. More ports degrade the performance.
- Supports IGMP version 1 and 2 only. Default is version 2.
- Ports that are directly connected to routers are discovered dynamically through snooping for routing protocols.
- IGMP is enabled or disabled per VLAN, and not per port.
- IGMP will run with GMRP, however, the IGMP does have higher priority than GMRP.
- The switch does not act as the querier. A router is required for IGMP on the switch to function.
- The switch will “snoop” on all incoming multicast addresses to detect query responses, as well as queries. Query responses are sent to the multicast address detected in the stream from the host requesting to receive queries. The frame is an IP frame of protocol type 2. If the frame is a response frame, IGMP will take the multicast address and VLAN ID, and program a filter on the receive port. The response is then forwarded out upstream ports so that the router will receive it. Ports that receive queries are marked as upstream ports. It is assumed a router exists somewhere off this port, and responses are sent here. If the switch detects a router protocol on a port, that port is also marked as a router port. This keeps the switch from blocking traffic to other routers.

A.3 DETECTING MULTICAST ROUTERS

The location of a router needs to be known in order to forward IGMP report frames back to the router. The router(s) send multicast routing protocol frames, which get flooded throughout the network. By snooping on the protocols, the switch will mark ports as connected to a router. The port is put in a “forward all” mode where all multicast frames will be flooded. This allows all types of IP multicast traffic (including IGMP streams) to go to the router.

There are many multicast routing protocols that the switch supports. These include the following:

- PIM version 1 and 2
- CBT (core based trees)
- MOSPF
- DVMRP

The routing protocols are detected as follows:

- All the multicast routing protocols have a destination address of 01-00-5E.
- DVMRP and PIM version 1 run over IGMP. If the IGMP frame type is not a REPORT, QUERY, OR LEAVE, then the frame is assumed to be one of these.
- PIM version 2 is IP protocol type 0x67.
- OSPF is IP protocol type 0x59. To detect that the frame is a multicast OSPF (MOSPF), the OSPF data must be looked at. The data starts after the IP header. Byte 31 (options) needs to be checked. If bit 2 is set (0x02 the MC bit), the frame is a MOSPF frame.
- CBT is IP protocol type 0x07.
- IGMP frames are detected by checking the IP protocol type. If the type is -x02, it is IGMP. The first byte following the IP header is the IGMP frame type and version. (Note that the lower 4 bits of the first byte in the IP header is the length of the IP header in 32 bit words.) The version is always 1, so the entire byte (version +type) may be used to check the IGMP type as follows:
    - 0x11 = query
    - 0x12 = report version 1
    - 0x16 = report version 2
    - 0x17 = leave

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